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USSR Report

SCIENCE AND TECHNOLOGY POLICY

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USSR REPORT

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USSR ACADEMY OF SCIENCES PRESIDENT ALEKSANDROV IN ARMENIA

Visits Mathematical Institute

GF091442 Yerevan SOVETAKAN AYASTAN in Armenian 21 Sep 84 p 1

[Text] A.P. Aleksandrov, president of the USSR Academy of Sciences and Hero of Socialist Work, and V.A. Kotelnikov, vice president of the USSR Academy of Sciences and Hero of Socialist Labor, visited the Mathematical Machines Scientific Research Institute in Yerevan. They acquainted themselves with the activities of the institute's collective and saw the exhibition at the history museum of the institute.

The scientists visited Abovyan where they met with enterprise workers, engineers, and technologists. They laid wreaths at the Soviet-Armenian friendship monument.

The guests were accompanied by K.S. Demirchyan, first secretary of the Armenian Communist Party Central Committee, and F.T. Sarkisyan, chairman of the Armenian SSR Council of Ministers.

Addresses Party Activ

GF091430 Yerevan SOVETAKAN AYASTAN in Armenian 20 Sep 84 p 1

[Excerpts] On 19 September, the republic's party, economic and propaganda aktivs held a meeting with the participants of the 41st session of the USSR Academy of Sciences' council for coordination of the scientific activity of the union republic academies of sciences at the Armenian Communist Party Central Committee session hall. The meeting was opened by K.S. Demirchyan, first secretary of the Armenian Communist Party Central Committee.

A.P. Aleksandrov, president of the USSR Academy of Sciences and Hero of Socialist Labor, addressed the meeting. He discussed the USSR energy program and the basic directions and ways for its success. He pointed out that the establishment of the energy program is the result of the united efforts of the scientists, experts, planning bodies, and corresponding ministries and departments.

While pointing out the existing substantial energy reserves in our country, the USSR Academy of Sciences president outlined the necessity of strengthening the struggle for their rational and careful use and saving fuel and other kinds of energy.

P.N. Fedoseyev, vice president of the USSR Academy of Sciences, reported on "a number of problems dealing with the perfection of developed socialism." He said that the basic directions and tasks set before the public sciences defined by the decisions of the 26th CPSU Congress are summed up in the June 1983 and February and April 1984 CPSU Central Committee Plenums and in the speeches of Comrade K.U. Chernenko. They point out the ways to effectively unite the achievements of the scientific and technical revolution with the advantages of the socialist ranks.

The meeting was attended by F.T. Sarkisyan, chairman of the Armenian SSR Council of Ministers, K.L. Dallakyan and G.M. Voskanyan, secretaries of the Armenian Communist Party Central Committee, and L.N. Nersesyan, first secretary of the Yerevan city party committee.

CSO: 1814/6

USSR SCIENCE ACADEMY COUNCIL CONVENES IN YEREVAN

GF040600 Yerevan KOMMUNIST in Russian 19 Sep 84 pp 1, 2

[Text] The objective tendencies of specialization and the cooperation processes related to them have become more profound in science and economy at the present time. Each of the republican academies of sciences is concentrating more forces on a definite number of scientific research projects with the aim of achieving measurable results in certain fields of science. For the successful implementation of the directions of the 26th CPSU Congress and the subsequent plenums of the Central Committee in the contemporary conditions, the activity of the coordination council is gaining more and more importance in uniting the forces of the academies of sciences of the union republics for jointly solving major scientific and technical problems and for maximizing the use of scientific potential.

The 41st session of the council in charge of coordination among the academies of sciences of the union republics which opened in Yerevan on 18 September is dedicated to the immediate problems of modern science which is supposed to boost social and scientific and technical progress.

A.P. Aleksandrov, president of the USSR Academy of Sciences, laureate of the Leninist and state prizes, thrice hero of the socialist labor and chairman of the council in charge of coordination among the academies of sciences of the union republics, opened the session with a speech.

He said: Our party has charged the country's scientists with the task of working out the scientific fundamentals of the radical growth of the effectiveness of the entire national economy. The scientists made considerable contributions to the creation of an energy program, to the verification of the Food Program and to the achievement of a complex program for accelerating scientific and technical progress. All this is considered to be a major contribution by science to the progress of society. And now, one of our major tasks is to achieve further programs more rapidly.

President of the USSR Academy of Sciences A.P. Aleksandrov spoke about what has been undertaken in this direction. He noted, in particular, that new forms of cooperation between the scientific institutions and industry will be established when the first results are obtained. The country's scientific institutions should make all efforts to solve the different scientific problems. The president of the USSR Academy of Sciences cited an example of how

owing to the research of the Soviet scientists our country declined to import a number of technological devices, substances, materials and instruments.

Giving concrete examples A.P. Aleksandrov warned against what would prevent the introduction of valuable scientific works in the national economy and spoke about the duplication of scientific themes and subjects which often leads to unnecessary loss of material resources and scientific potential. He stressed the usefulness of cooperation between the academic institutes and the specialized institutions.

The participants in the session warmly greeted F.T. Sarkisyan, chairman of the Armenian SSR Council of Ministers. He said: The achievement of progressive socialism and the acceleration of scientific and technical progress require deep scientific analysis and elaboration of the well-established prognoses of the socioeconomic development in the mature socialist society. Comrade K.J. Chernenko noted at the June 1983 CPSU Central Committee Plenum that the scientific workers are required to function with great orientation to build the future and to timely cope with pressing tendencies. Namely, for this reason it is fully understood why the current session of the council is supposed, in addition to the problems of exact sciences, to discuss also the tasks of the social sciences in the contemporary stage of our development.

Comrade F.T. Sarkisyan noted that the research conducted in the scientific institutions of the Armenian SSR Academy of Sciences has specified to a considerable extent the major directions of the republic's economic growth for many years to come. However, the means connecting science and production which guarantees the rapid utilization of the latest achievements of science and technology is still inadequately and unreliably functioning in order to maintain scientific and technical progress.

F.T. Sarkisyan pointed out that this is because of weak links between the republic's academy of sciences and the colleges and specialized sciences. And here, a great task is facing the coordination council of the republic's academy of sciences which is required to achieve an organizational and functioning integration of the scientific institutions and VUZ's.

Concluding his speech, Comrade F.T. Sarkisyan wished the participants in the session further success in their responsible work for the benefit of our great homeland.

P.N. Fedoseyev, vice president of the USSR Academy of Sciences, presented a report entitled "Soviet Science in New Boundaries." He said: our coordination meeting in the capital of Armenia, Yerevan, is held at a very responsible period in the life of the country. Fulfilling the decisions of the 26th CPSU Congress the Soviet people are approaching an important stage ending the 11th 5-Year Plan period. Now that some months are left before the end of the 5-year plan period it is particularly necessary as was noted at the April 1984 CPSU Central Committee Plenum to mobilize all resources and capabilities for the absolute fulfillment of the tasks of the 11th 5-Year Plan.

[GF040610] Preparations are being made to more actively and adequately respond to the regular 27th congress of the party which will adopt a document of historic significance--the new wording of the CPSU program. Comrade K.U. Chernenko noted that preparation for the congress is a period for summing up what has been achieved, a period for actively consolidating all the positive results we have achieved. It is a time for extracting lessons from mistakes, a time for critically analyzing the shortcomings and determining the manner of eliminating them and the ways of solving the new major tasks.

The June CPSU plenum accurately specified a major program task for the current stage--the planned and comprehensive improvement of progressive socialist society. The dynamic and forward-moving development of the Soviet economy and the success in improving the social policy of the party demonstrate the unquestionable advantages of socialism as a system insuring steady progress in all walks of social life. These advantages and their full complete implementation were deeply elucidated in the documents of the economic meeting of the Council for Mutual Economic Assistance which was held last June. These documents again reflect the collective will of the fraternal parties of the socialist countries and further consolidate their unity and solidarity for the benefit of socialism, stabilization of the international situation and maintenance of peace and security of peoples.

In the solution of the tasks facing our country, an increasing role and responsibility belong to Soviet science, especially the academic scientific institutions and to the social sciences which are supposed to envisage the vital problems in the social progress of socialism. During the period after the June CPSU Central Committee plenum, the USSR Academy of Sciences and the academies of sciences of the union republics made considerable efforts to implement the decisions of the plenum, to eliminate the shortcomings and to make a decisive change in the scientific institutions and scientific societies for fulfilling the major practical tasks which life has brought to our society.

The USSR Academy of Sciences and the republican academies of sciences have instituted measures that are aimed at improving the planning and organization of scientific research, at more precisely defining the problems of research for the purpose of concentrating the forces and means on the major directions to increase production effectiveness, accelerate the scientific and technical progress, and improve the ideological and mass political work. Special attention has been devoted to the tasks emerging from the necesstiy of moving to a new and considerably high level of ideological-theoretical work in the field of social sciences and first and foremost in the economic sciences.

Particularly thorough and comprehensive work to raise the theoretical level of effectiveness and practical significance of the scientific research, and to improve the organization, planning and style of the work of the scientific institutions was carried out in the field of economic and sociological research.

In accordance with the instructions of Comrade K.U. Chernenko on the necessity of deeper elaboration of the perspectives of the economic and social progress

of our society, more effective combination of the latest results of science with concrete scientific-technical and economic and social calculations and his critical remarks at the June CPSU Central Committee Plenum on the shortcomings in the activity of the central economics and mathematics institute of the USSR Academy of Sciences and his instructions on the improvement of the scientific grounds of the economic and social prognoses, the USSR Academy of Sciences specified measures for radically improving the work of the corresponding scientific institutions in the field.

The elimination of the serious shortcomings in the organization of the scientific research, the qualitative improvement of the work in the field of coordinating the economic research conducted in the country, the concentration of forces on the study of the first priority problems, the ability to differentiate between what is major and what is not major and to concentrate on the solution of the major problems of the creative potential of the economic science remain vital tasks facing our institutions. The delay in solving these questions is intolerable because we have already entered into the stage of formulating the scientific research plans for the 12th 5-Year Plan and all the scientific institutions of the economic type are required to take additional measures and make further efforts and devote further attention to the problems of the practical approach of the Soviet economy toward further intensive progress.

After that the speaker dwelt at length on the questions of further developing a number of social sciences. Through research on vital problems we can make a new wording in the party program. Obviously, we can say that the preparation for this wording itself is at the same time a review of the progress of social sciences and criteria of the degree of effectiveness of assistance they offer to the party in the cognition of the development of our society in conformity with natural laws and in the determination of the objectives and perspectives of its historical movement.

In the contemporary conditions the complex program of the USSR scientific-technical progress through 1985-2005 can be regarded as initial material for those concrete prognoses calculations which are essential for the scientific grounds of the qualitative characteristics of the perspectives of our society's progress reverberated in the new wording of the CPSU program. Considerable significance belongs to the major socioeconomic programs such as the food and energy programs which will find their places in the wording of the CPSU program.

[GF040620] The party has created all the necessary conditions for fruitful work by all Soviet scientists. At the same time, it makes high demands on the quality of scientific activity so that science can assist the party and the people more actively and effectively in solving the historical questions for improving mature socialism and for consolidating peace on earth. It is possible to say with confidence that the wide introduction of the mathematical modeling and computer experiment remains the major direction of scientific-technical progress," said Academician A.A. Samarskiy, deputy director of the applied mathematics institute of the USSR Academy of Sciences. Generally speaking the method of modeling has been for a long time well known in science and technology.

The mathematical models which are implemented in contemporary research are so difficult that their analysis is only possible with the use of modern highly productive computers. Moreover, the difficulty of models increases so swiftly that it is not easy for the computer designers to keep pace with such increase. The effectiveness of the conducted fundamental and applied scientific research has increased in recent years in the fields of developing the elaboration of the theory of computer technology and programming security and in the field of creating new means of computer technology and their use in the various spheres of scientific research and national economy. As a result of this it has become more necessary to consolidate the coordination role of the USSR Academy of Sciences with the purpose of uniting the efforts of the academic institutions, institutes and organizations of the various ministries and departments for solving the most important problems related to the creation of means of computer technology and their effective use.

The analysis of the contemporary state in the field of computer technology shows that the works insuring the creation of computers with primary high productivity (super computers), microprocessing technology, personal computers and means of computer technology related to the creation of robot technology, flexible productions and their programming security constitute the major direction of fundamental research. The successful solution of these problems insures the creation of a computer base for further fundamental research and for the solution of the most important national economy tasks.

In the contemporary conditions great importance belongs to the highly reliable computers with programming security for expanded use in scientific research and in the national economy. With this aim fundamental research is being conducted to create personal computers with their mathematical security. The mathematical modeling and computer experiments using powerful computers, automated experimental research on the basis of computer technology, microcomputers and microprocessing technology are considered to be the major directions in the field of information. On the basis of the local means of computer technology automated systems with numerous facilities are being created and used in the majority of the academies of sciences of the union republics, scientific centers and branches of the USSR Academy of Sciences.

Devoting great importance to the creation of automation systems on the basis of computer technology, the USSR Academy of Sciences and the academies of sciences of the union republics are expanding their work in this field. This research is continuing in the direction of automating production, control processes and scientific research. For successfully solving the problems of creating contemporary means of computer technology it is necessary to conduct research on the precise technology and production of microchips, highly pure metals and various chemical combinations, processes and equipment for producing laminated structures and for creating methods and means of materials quality diagnosis and microelectronic structures with high level of sensitivity, localization and accuracy using the modern automation means.

V.A. Ambartsumyan, president of the Armenian SSR Academy of Sciences, briefed the participants on the research on transient phenomena in the universe and coordination between the USSR Academy of Sciences and the academies of sciences of the union republics on these works.

[GF040630] The speaker said: The research on the transient phenomena has acquired great importance in contemporary astrophysics. It covers all the new fields of astrophysics and is considered to be the most useful area for using new methods, including radio astronomy, roentgen astronomy, etc. Many important ideas for this problem came into existence in the USSR, where a considerable number of astronomical discoveries concerning different aspects of astronomy were made. Among them it follows to note a number of discoveries related to the transient processes on the sun, the discovery of the majority of the galaxies with most active nucelli, more than one-third of the known present stars, about half of all the known cometary nebulas and approximately one-third of the Kherbig Aro [as published] projects, many of the supernova star flares and others.

After that, Academician V.A. Ambartsumyan noted that in addition to this, the V Lume of the scientific research which requires the good art of observation and instruments with high sensitivity and angular resolution is still inadequate and the works to organize large interferometric radio astronomical networks are going slowly. The leaders of the astronomy institutions are not always showing the necessary persistence in equipping the Soviet telescopers with the reliable instruments and they also devote little attention to the creation of new and more perfect devices.

H.S. Bshirkov, deputy chairman of the coordination council, presented a report on the progress in fulfilling the decisions of the previous sessions of the coordination council. He briefed the participants in the session on the fundamental measures for developing research in the field of the fuel and energy complex and energy preservation technology and on the questions of improving the coordination of economic research, increasing its effectiveness and practical use and activating the research which allows for verification of the USSR Food Program.

More characteristic examples on consolidation of the coordinating role of the academies of sciences, scientific centers and branches of the USSR Academy of Sciences and examined measures for creating centers using unique sophisticated scientific equipment and for consolidating the experimental base of the academies of sciences of the union republics, scientific centers, and branches of the USSR Academy of Sciences on account of the production organizations of the corresponding ministries and departments.

Participating in the opening of the 41st session of the council in charge of coordination among the academies of sciences of the union republics were K.S. Demirchyan, first secretary of the Armenian Communist Party Central Committee; K.L. Dallakyan, secretary of the Armenian Communist Party Central Committee; L.N. Nersesyan, first secretary of Yerevan Gorkom of the Armenian Communist Party; G.S. Sagoyan and Yu. E. Khodzhamiryan, deputy chairman of the Armenian SSR Council of Ministers; and A.P. Melkonyan, chief of science and education institutions of the Armenian Communist Party Central Committee.

CSO: 1814/6

INTRODUCTION OF SCIENTIFIC RESEARCH ACHIEVEMENTS IN ARMENIA

Yerevan KOMMUNIST in Russian 24 Jul 84 p 2

[Article by A. Agababov, chief of the Science and Technology Department of the Armenian SSR State Planning Committee: "Scientific Research Work: The Means of Rapid Introduction"; passages rendered in all capital letters printed in boldface in source]

[Text] In our republic positive changes have been achieved in the planning of scientific research work on the basis of the goal program method. Whereas at the beginning of the current five-year plan scientific institutions were conducting research on 42 goal and comprehensive programs, at present they are conducting research on 53, including 14 comprehensive goal programs of all-union importance, 9 of republic importance and 30 programs on the solution of the most important scientific and technical problems.

In the past 3 years of the 11th Five-Year Plan more than 1,200 scientific research and experimental design developments have been completed.

ABOUT 2,500 MOST IMPORTANT MEASURES ON NEW EQUIPMENT WERE INTRODUCED IN THE NATIONAL ECONOMY, THE ANNUAL ECONOMIC IMPACT FROM THEIR INTRODUCTION CAME TO ABOUT 150 MILLION RUBLES.

A number of completed scientific research efforts with respect to the scientific institutions of the Academy of Sciences, the Ministry of Higher and Secondary Specialized Education, the Ministry of Agriculture and other ministries and departments, as well as scientific institutions of union subordination were introduced.

Research, which is of great practical importance in the area of the radio physics of superhigh frequencies, on the development of highly sensitive radiometric equipment, radio receivers and semiconductor electronics was conducted at the Institute of Radio Physics and Electronics. The results of the majority of studies have been introduced in radio electronics. New lasers were developed at the Institute of Physics of Condensed Mediums of Yerevan State University. At the Institute of Microbiology a system of the storage of cultures was developed with the use of computers, new effective cultures for the production of bacterial earth fertilizing compounds were obtained.

In agriculture developments on new methods of the forecasting of pests and diseases of agricultural plants in various zones of the republic and technological processes of the preserving, pelleting and granulating of fodders have been completed.

A number of designs of experimental apartment houses and complexes were developed at the Armenian NIISA [not further identified]. Meanwhile the efficiency of the work of individual scientific institutions remains low.

Thus, with respect to the scientific institutions of the Armenian SSR Academy of Sciences during 1981-1983 30 works and technical developments were completed. However, it is possible to group only 11 among those which are of great national economic importance, and 7 of them were introduced earlier, while 4 have not been completed.

At higher educational institutions an extremely inadequate number of large-scale, comprehensive studies of scientific problems of great national economic importances are being conducted through budget financing. In recent years suggestions on their use have not been received. The situation is similar at scientific institutions of the agricultural type.

THE DISPERSAL OF ASSETS AND OTHER MATERIAL RESOURCES AMONG NUMEROUS THEMES, WHICH IN THE MAJORITY OF CASES ARE NOT OF GREAT NATIONAL ECONOMIC IMPORTANCE, REMAINS THE MAIN CAUSE OF THE LOW EFFICIENCY OF THE WORK OF SCIENTIFIC INSTITUTIONS. There are no goal programs from the elaboration of the theme to the introduction of the results of research.

The majority of suggestions on the use of completed developments are submitted to the republic State Planning Committee in unfinished form and do not meet the requirements of the General Statute on the Procedure of the Acceptance and Evaluation of Completed Developments, which was approved by the USSR State Committee for Science and Technology.

With respect to the scientific institutions of the Academy of Sciences a number of works, which are of national economic importance, were completed, but they were not accepted by the Interdepartmental Commission, including with respect to the institutes of physics research, chemical physics, general and inorganic chemistry, organic chemistry and so on.

The listed facts attest that it is necessary to increase the responsibility of the executives of scientific institutions for the timely and high quality completion of work in accordance with established procedure.

In the decree of the CPSU Central Committee and the Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy" and the corresponding decree of the Armenian CP Central Committee and the republic Council of Ministers the task is posed to ensure during the next few years the production of machines, equipment, instruments, materials and other products of domestic industry, which conform in their technical and economic indicators to the highest world level, as well as the introduction of the technology and advanced methods of the organization of

production and on this basis to increase labor productivity substantially in all the sectors of the national economy.

THE ACCOMPLISHMENT OF THE POSED TASK IS BASED FIRST OF ALL ON THE INCREASE OF THE EFFICIENCY OF THE WORK OF SCIENTIFIC INSTITUTIONS AND THE RAPID INTRODUCTION OF COMPLETED SCIENTIFIC RESEARCH WORK IN PRODUCTION.

Life and practical experience confirm: one of the ideal forms of the management of scientific and technical progress is scientific production associations. In recent years definite work has also been done in this direction in the republic. The Nairit, Armstanok, Armsel'khozmekhanizatsiya and other scientific production associations have been established. A student special planning and design bureau and a pilot experimental plant have been set up at Yerevan Polytechnical Institute imeni K. Marx, an experimental design bureau was set up under the auspices of the Institute of Physics of Condensed Mediums of Yerevan State University and so on.

The further development of the network of production and scientific production associations and enterprises and the concentration of the forces and assets of scientific research, design, planning, planning and design and technological organizations are a means of accelerating scientific and technical progress. The lag in this matter in agriculture, construction and transportation should be overcome.

SUCH AN IDEAL FORM OF THE MANAGEMENT OF SCIENTIFIC AND TECHNICAL PROGRESS AS THE SCIENTIFIC PRODUCTION ASSOCIATION CAN ALSO BE USED IN THE SYSTEM OF THE ARMENIAN SSR ACADEMY OF SCIENCES AND THE ARMENIAN SSR MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION.

At present the need has arisen for the establishment of scientific production associations on the basis of the Institute of Radio Physics and Electronics, the Institute of Fine Organic Chemistry imeni Mindzhoyan and the Institute of General and Inorganic Chemistry of the Armenian SSR Academy of Sciences, as well as the Institute of Physics of Condensed Mediums of Yerevan State University and the Scientific Research Center of Yerevan Polytechnical Institute.

Suggestions on the setting up of temporary collectives for the rapid implementation of goal programs are being submitted for consideration to the USSR State Committee for Science and Technology by the Armenian SSR Council of Ministers, they are intended for the performance of work on the solution of long-range scientific and technical problems of an intersectorial nature. The statute on them was approved by the USSR State Committee for Science and Technology, in which the basic tasks are specified: the development in the shortest possible time of fundamentally new equipment, technology and materials of intersectorial use, which exceed the world level.

THE ACADEMY OF SCIENCES, THE MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION AND THE EXECUTIVES OF OTHER MINISTRIES AND DEPARTMENTS OF THE REPUBLIC SO FAR ARE NOT USING THE RIGHTS GRANTED TO THEM AND ARE NOT

SUBMITTING SUGGESTIONS ON THE SETTING UP OF TEMPORARY COLLECTIVES FOR THE SOLUTION OF LONG-RANGE SCIENTIFIC AND TECHNICAL PROBLEMS OF AN INTERSECTORIAL NATURE.

For the purpose of speeding up the introduction of completed scientific research in industrial production at present it is permitted to organize a pilot (experimental) enterprise. A statute on it has been approved by the USSR State Committee for Science and Technology. All this is creating favorable conditions for the assimilation of test and other models (batches) of new products in various sectors of the national economy. The Academy of Sciences, the Ministry of Higher and Secondary Specialized Education and other ministries and departments so far are not submitting suggestions on the organization of such enterprises, while the need for them arose long ago at the institutes of radio physics and electronics, fine organic chemistry and other scientific institutions of the Academy of Sciences, the State Committee for Construction Affairs and other ministries and departments of the republic.

In the accomplishment of the tasks of introducing completed developments the availability and level of the technical base are of great importance. The improvement of the use of experimental bases and the setting up of centers for the collective use of single-design equipment are of considerable importance here. In accordance with a decree of the Armenian SSR Council of Ministers such centers have been set up in the system of the Academy of Sciences, the Ministry of Higher and Secondary Specialized Education and in other ministries and departments.

One of the main conditions of the setting up and technical equipment of the experimental base is the construction of new laboratories for them. During the past years of the 11th Five-Year Plan, through the fault of the contracting construction organizations of the Ministry of Industrial Construction and the Main Administration of Installation and Special Construction Work the fulfillment of the plan of capital investments has been systematically upset. With respect to the organizations of the Armenian SSR Academy of Sciences more than 1.5 million rubles remained unassimilated.

The construction of the collective greenhouse of the Institute of Botany has been under way since 1977 and so far it has not been completed, the situation is the same with the laboratory building of the Byurakanskiy Astrophysics Observatory and other projects.

For the purpose of stimulating valuable initiatives it is permitted to pay bonuses to supervisory engineering, technical and other specialists (of enterprises) and scientific research institutions in excess of the set maximum amounts for the development and introduction of new equipment, advanced processing methods and materials, which in the most important indicators correspond to the world technical and economic level or exceed it, as well as for the increase of the proportion of new highly efficient products in the total production volume.

The fulfillment of the plans and assignments on the development of science and technology is now the most important indicator, in accordance with which the results of economic operations are evaluated.

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CSO: 1814/4

IMPROVEMENT OF GRADUATE STUDIES IN UZBEK SSR

Tashkent PRAVDA VOSTOKA in Russian 19 Jul 84 p 1

[Article: "If You Are a Graduate Student"]

[Text] Consistency of aim, a taste for the new, a creative spark in the soul, the ability to manage one's own time optimally, which are multiplied by the specific knowledge of the object of the exertion of efforts--this is far from a complete list of the qualities which the person, who is enrolling in graduate studies, should have. Here he is first of all obliged himself to ask himself strictly and exactingly: Will I be able to make a contribution to science, will I have enough spiritual and physical powers for the overcoming of difficulties? Will I have enough talent and persistence in the achievement of the cherished goal? The 16th Uzbek CP Central Committee Plenum, on the agenda of which the question of work with personnel was posed strictly, in all its profundity, directs attention to precisely such a verified and responsible approach to the choice of the occupation, to which each young person, including the young scientist, has decided to devote his life.

The June (1983) CPSU Central Committee Plenum and the 7th Uzbek CP Central Committee Plenum posed with all urgency the question of the effectiveness of science. Special demands here were made on the training of scientists and the reinforcement of their ranks from graduate students. It is necessary, however, to note that capable, talented young people are not always admitted to graduate studies. Little use comes from such graduate students. And, as a consequence, at a number of higher educational institutions of the republic only a small portion of the graduate students defend their dissertations on the stipulated dates, while a significant portion complete graduate studies without a defense.

In 1983 739 graduate students were graduated by the scientific research institutes and higher educational institutions, which are subordinate to the Uzbek SSR Council of Ministers. Of them only 57, or 7.7 percent, defended themselves on time. While 305 of their graduates, or less than half of the total number, completed graduate studies with presentation for defense.

It is worthwhile for some young people to think over whether they hold the place of more worthy people and to understand in the end that graduate studies are not a quiet backwater, where it is possible to spend the hours from bell to bell. Graduate studies of today are the tomorrow of science. And there is

a place in them for enthusiastic, resourceful, working people, who do not take personal time into account and, of course, have the appropriate abilities and knowledge.

Today we should approach with all adherence to principles and a thorough understanding of the tasks of mature socialist society the choice of young specialists for graduate studies. Here talent should be revealed as early as possible. Interesting experience in the training of the young scientific generation has been gained at the Tashkent Electrical Engineering Institute of Communications. This work begins with the first years. Here groups of the intensified basic training of students are being set up, the most precise system of the education of the future scientist, which "closes" in a sequential chain a number of measures which follow from each other: "intensified basic training in physics and mathematics--intensified special training in a specific theme--graduation designing with the same supervisor--the continuation of scientific work under his supervision," is being introduced. The practice of the preparation and defense of course and graduation works has also been significantly revised. For the most part they are not of a report nature, but of a scientific research nature. They are boldly enlisting in scientific research and economic contractual work the students, who have displayed an aptitude for creative research and show more thorough knowledge and ability. All this is making it possible to make the selection of candidates for graduate studies most demanding.

They are also devoting proper attention to the questions of increasing the effectiveness of graduate studies at the Kibernetika Scientific Production Association of the Uzbek SSR Academy of Sciences. Here they are closely coordinating the dissertation themes with the themes of the institutes. Graduate students from the first days are aimed at a specific object of the introduction of their work, the entire technical base of the association and the entire pool of computers are made available to them, particular attention is directed toward the introduction of the results of research in the national economy.

But, while increasing as a whole the effectiveness of graduate studies, it is necessary first of all to improve radically the general methodological training of graduate students and to improve significantly the quality of dissertation research, remembering that the dissertation is first of all a most important form of scientific research, theoretical conclusions and the elaboration of practical recommendations and, therefore, a means of obtaining an academic degree. Therefore, the executives of institutes, chairs, laboratories and scientific councils are called upon to devote particular attention to the preparation of dissertations and to enlist in the scientific supervision of graduate students and seekers of degrees the best specialists, who are also capable of enriching the spiritual world of their students and of increasing their ideological and theoretical level.

The quality of dissertation research in many ways depends on the scientific councils for the awarding of academic degrees. And it must be said that for their most part they are ensuring the necessary level of the training of scientists. Evidence of this is given if only by the fact that in individual uncommon specialties the councils accept for defense the dissertations of

representatives of not only our, but also other republics. And still serious shortcomings exist in this most important section of the organization of scientific research. The councils does not always make the proper demands on the content and themes of dissertations. Some works of graduate students are of a low scientific level and are of neither theoretical or practical value. The unscrupulous, subjective attitude of some reviewers and members of the council to the evaluation of dissertation works is a great harm, the duplication of themes also has still not been eliminated. The cases of the rejection by the Higher Certification Commission of a number of decisions on the awarding of academic degrees attest to the obvious flaw in the work of the scientific councils. This would not have happened if in case of the defense of dissertations an atmosphere of creative discussion, great demandingness and adherence to principles had been created locally, if, when evaluating a dissertation, the level of the scientific, ideological and theoretical training of the seeker of the degree had been evaluated at the same time. Cases, when individual people strive to enroll in graduate studies by the back door, are still occurring. Here they count not on their knowledge and abilities, but on telephone calls, family ties and the position held by their parents in science. When analyzing and reviewing today the work on the training of a worthy new scientific generation from the standpoint of the great demands of the 16th Uzbek CP Central Committee Plenum, the party organizations and all the communists of higher educational institutions and scientific institutions should decisively rebuff such displays.

It must not be forgotten that graduate studies are the basic means of the emergence and formation of young scientists. Therefore, the questions of the further improvement of the system of training of personnel through graduate studies should constantly be at the center of attention of party organizations, scientific institutions, higher educational institutions and their scientific councils. The Uzbek SSR Academy of Sciences, the Central Asian Department of the All-Union Academy of Agricultural Sciences imeni Lenin, the republic State Planning Committee and all interested ministries and departments must coordinate more closely their actions on the selection and placement of scientists. It must not be forgotten that recruitment for graduate studies is a matter of state importance. It is necessary to know how to forecast, to look at tomorrow, to take into account the promise of each candidate for a place in graduate studies and what kind of return he will give to science and the national economy.

Will each graduate student become a real scientist? Will the considerable public assets, which were spent on his training, be repaid with interest? This in many ways also depends on how his scientific adviser in particular and the collective as a whole help him to become firmly established in this lofty title.

7807
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DEVELOPING AND ORGANIZING PRODUCTION OF MACHINE-BUILDING INDUSTRY PRODUCTS

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 4, Apr 84 pp 8-13

[Article by V. N. Bakman, candidate of technical sciences and V. V. Cherevichnyy, Leningrad Scientific-Production Association "Lenmyasomolmash" (Leningrad meat and dairy machinery)]

[Text] One of the ways of increasing the efficiency of work is the improvement of the system of developing and placing a product in production. The basic procedure for developing and placing a product of the machine-building industry in production is limited by GOST 15.001--73 standard. However, each sector has its own particular features, which must be taken into account in the work process. Especially great difficulties are encountered in the work of ministries and departments which are not among the leaders in machine-building, for example, the USSR Ministry of the Meat and Dairy Industry, which contains more than 50 project design organizations within its system, engaged in development of technical documentation for new equipment, as well as machine-building enterprises fabricating industrial products (from experimental models to mass production products).

Until 1980 in the system of the USSR Minmyasomolprom [Ministry of Meat and Dairy Industry] all enterprises developed documentation at their own risk and responsibility, coordinating it, and not always at that, with various levels of the USSR Minmyasomolprom and the minmyasomolproms of the Union republics. Such a situation often led to a prohibition of the development of documentation or of production of the output on the part of local GOST organs on the basis of flagrant violations of normative-technical documentation, and especially GOST 15.001--73.

In 1979 RTM [Technical instruction materials] 49-09--79 "Organization of the production of products" was developed for the purpose of bringing order into design documentation. In 1981 this document was revised taking into account the particular features of the development and production of new products at the enterprises of the USSR Minmyasomolprom as well as changes in GOST 15.001--73 and other normative--technical documents.

What are these features? First of all it should be noted that the organizations of the Ministry of Machine Building for Light and Food Industry and Household Appliances develop all sectorial normative-technical documents for

the products of the machine-building industry. For this reason the design organizations of the USSR Minmyasomolprom receive normative-technical documentation with great delays, which leads to serious deviations of the documentation developed by the designers from the newly established NTD [normative-technical documents].

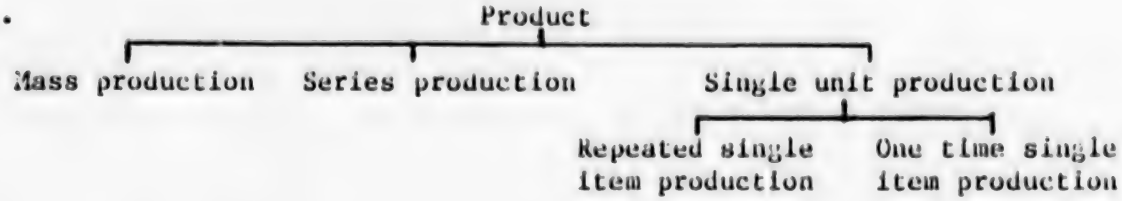
An essential factor determining the possibility of placing in production various types of machines and equipment is the production structure of the machine-building enterprises of the ministry. In accordance with GOST 14.004--74 these enterprises belong to the category of single-item production enterprises with a low level of equipment. In connection with this, the startup of production of new products of the machine-building industry takes a longer time than that of similar equipment produced by Minlegpishchemash [Ministry of Machine Building for Light and Food Industry].

These features were reflected in document RTM-49-09--81 "System for the development and organization of the production of products. Machines, equipment and inventory of the meat and dairy industry," developed by the Leningrad scientific-production association Lenmyasomolmash of the RSFSR Ministry of Meat and Dairy Industry. This RTM applies only to items developed, produced or used by enterprises and organizations of the USSR Minmyasomolprom or the minmyasomolproms of the Union republics. However, many developers rely fully on the requirements of the RTM indicated above in carrying out work projects jointly with the Minlegpishchemash, which leads to disagreements with the producer enterprises. In this case it is accesary to be guided by sectorial documents developed by the USSR Minlegpishchemash and to enter into agreements with the administrations and scientific research organizations of the USSR Minmyasomoprom only in accordance with appendix 1 to RTM 49-09--81, and here it is necessary to draw the attention of the developers to the following. The sequence of work of the organizations of the USSR Minmyasomolprom and the minmyasomolproms of the Union republics--the developers of design documentation--and enterprises of the Minlegpishchemash--the producers of the items--is similar to the work described below on the development and placing in production of products of the machine-building industry at enterprises of the USSR Minmyasomolprom or the minmyasomolproms of the Union republics. In case design documentation is transferred to enterprises of the Minlegpishchemash for series production of items, the acceptance tests for the experimental samples must be performed with the participation of Minlegpishchemash representatives, and the test certificate must be approved by the head of the appropriate production association of the Minlegpishchemash. In this, the maker of the experimental sample item, as a rule, must be the enterprise of the Minlegpishchemash which is the series producer of the item.

Many questions arise, especially among the developers, in regard to establishing criteria for relegating products to a certain type (series, mass and single item). GOST 14.004-74 "YeSTPP [Unified system for technological preparation for production]. Terminology. Basic principles. Terms and definitions of the basic concepts" gives a definition of the type of production only in relation to the entire enterprise, which is unacceptable in relation to the production of a specific type of item. The outline for subdividing products according to type in accordance with the All-Union Scientific Research Institute of Standardization (RD 50-285081) is given in Fig. 1.

The distinguishing features of mass production items are continuous production and large production volume (more than 1,000 pieces per year): series production--production in individual batches during the year; repeated single-unit production--periodic production of single items, with the interim period between the production of two items longer than the production cycle; one-time single-unit production--unique and large machines and specialized production equipment. Single item production should be discussed in greater detail. In connection with the fact that single item production is distinguished by its great variety, amendment No. 3 to GOST 15.001-73 provides for two versions of it: repeated production and one-time production.

Fig. 1.



Products of repeated single item production are characterized by the repeated production of each item in the course of a considerably long time interval, in this it approaches series production. Its difference from series production lies in the fact that a period of time must pass between acceptance of the previously built item and the start of the fabrication of the next one. Thus, if the production cycle is one month, the enterprise cannot produce more than 12 items per year. This type of product should include items produced from standard designs and repeated when the same type of meat and dairy industry enterprises are built.

Items of one time single item production are products or batches of products which are fabricated at one time and for one customer, when no repeat production is anticipated. For this reason all equipment developed for enterprises under construction and previously defined by the term "non-standardized" is equipment for one-time production, and consequently must be produced in accordance with the requirements of GOST 15.001-73. Although there is a provision in RTM that it does not cover non-standardized equipment for capital construction, this restriction is due to be rescinded shortly. Thus the RTM contains the procedure for the development and placing in production all types of products. The diagram of the sequence of operations is shown in Figs. 2, 3 and 4 (products in series and mass production, repeated single unit production and one time fabrication respectively).

It can be seen from the diagrams shown that an application with initial requirements is the initial document for any type of products. Since as a rule the initial requirements are officially compiled on the basis of the results of scientific research of an applied nature, this should be considered a forerunner of project design work.

The procedure for carrying out scientific research work is determined by GOST 15.101-80. Experimental samples, mock-ups, models etc. are fabricated in the course of scientific research. The development of documentation for these proceeds in accordance with the procedures established in the given organization.

Often the developers of the scientific research project submit an experimental sample for acceptance testing as a test product. This error leads to a whole series of other errors, which in the end leads to a violation of GOST 15.001-73. It should be remembered that an experimental item does not undergo acceptance testing.

Fig. 2. Initial requirements--developed by a sectorial scientific research institute or the developer of the item.

Application--developed by the customer, approved by the deputy minister of the USSR (or republic) Ministry of the Meat and Dairy Industry.

Project requirement--compiled by the organization developing design documentation, approved by the chief of the Technical Administration of the USSR Minmyasomolprom (or the deputy minister of the meat and dairy ministry of the Union republic).

Development of design documentation (technical proposal, draft design, technical project draft)--examined in the council on design projects at the Technical Administration of the USSR Minmyasomolprom (or at a conference at the customer's organization). The protocol of the examination is approved by the deputy minister of the USSR meat and dairy industry (or the chief of the customer organization).

Development of working design documentation.

Fabrication of a test item (test batch)--performed by the enterprise selected as the series producer.

Preliminary testing of the test item (test batch)--as a rule performed in two stages: plant and operational.

Correction of design documentation with the application of the letter "O"--performed by the developer on the basis of the preliminary testing.

Acceptance testing of the test item (test batch)--organized by the developer.

Correction of design documentation with the application of the letter "O_1"--performed by the developer on the basis of the results of the acceptance testing.

Transferance of the documentation to the producer enterprise.

Fabrication of the adjustment series.

Testing of the adjustment series--performed as a part of operational testing according to a test program and test methods.

Correction of design documentation with the application of the letter "A"--performed by the holders of the originals.

After the conclusion of the scientific research work the experimental items can be used in production, if at the time they are approved for production operation the customer confirms the possibility of their use at a specific enterprise and in accordance with current rules for the operation of similar equipment, and with the concurrence of organs responsible for operational safety, compliance with sanitary norms, etc.

Fig. 3. Initial requirements--developed by a sectorial scientific research institute or the developer of the item.

Application--developed by the customer, approved by the deputy minister of the USSR (or republic) Ministry of the Meat and Dairy Industry.

Project requirement--compiled by the organization developing design documentation, approved by the chief of the Technical Administration of the USSR Minmyasomolprom (or the deputy minister of the meat and dairy ministry of the Union republic).

Development of design documentation (technical proposal, draft design, technical project draft)--examined in the council on design projects at the Technical Administration of the USSR Minmyasomolprom (or at conference at the customer's organization). The protocol of the examination is approved by the deputy minister of the USSR meat and dairy industry (or the chief of the customer organization).

Development of working design documentation

Fabrication of a test item (test batch).

Preliminary testing of the test item (test batch)--as a rule performed in two stages: plant and operational.

Correction of design documentation with the application of the letter "O"--performed by the developer on the basis of the preliminary testing.

Acceptance testing of the test item (test batch)--organized by the developer.

Correction of design documentation with the application of the letter "O_1"--performed by the developer on the basis of the results of the acceptance testing.

Transferance of the documentation to the producer enterprise.

A common feature of the development and the placing of an item in production is that the enterprises and organizations involved are under the jurisdiction of either the USSR Minmyasomolprom or the minmyasomolproms of the Union republics. In this connection the RTM contains requirements for coordination and approval of documentation depending on the plan on the basis of which the development is being carried out. A feature of the development and the placing in production of series and mass production items is the requirement of going through all the stages provided by GOST 15.001-73. The individual stages should be discussed separately. The development of the project requirement is often begun in the absence of an officially submitted and approved application. Such a violation of the requirements of normative-technical documentation frequently leads to serious difficulties during the phase of reaching agreement on the project requirement.

Fig. 4. Initial requirements--developed by the customer.

Application--developed by the customer. Application not subject to approval.

Project requirement--approved by higher authority within the organization of the customer.

Development of the technical project draft--examined in the technical council of the developing organization with customer participation.

Development of working design documentation.

Fabrication of the items in the quantity specified in the application.

Acceptance and delivery testing.

In accordance with current normative-technical documentation, the customer is the developer of the application. In practice (especially on developer's initiative projects) the application is often submitted by the developer. But in this case too, the signature of the customer is necessary. Frequently the customer does not sign the application until the subject is included in the plan for project design work of the developer organization. But it is precisely on the basis of officially submitted applications that the plan for project design work must be developed. For this reason the applications can and must be officially processed during the year preceding the plan year.

The completion of several columns in the application bears some attention. For one time single item production, the column "Anticipated need for the equipment ordered during 5 years (by year) from the beginning of industrial production" shows the specific order volume, and column V (5a) ("fabrication of test item") is left blank.

The application often does not indicate the enterprise producing the test item and the enterprise of series production. For example, of 30 products undergoing

expert evaluation during the first half of 1983 at the Lenmyasomolmash Scientific-Production Association as a primary standardization organization, producer enterprises were indicated in only eight applications.

The second stage that bears discussion is the development of the project requirement. The most frequently encountered error by the developer is the inclusion of specifications and parameters for the measurement of which no standard means and measurement methods exist.

Attempts to develop project requirements for sets of equipment are a serious error. In doing this, developers and organizations in higher authority ignore the definition of sets as cited in GOST 2.101-68. For this reason, if the name of the subject begins with the word "set," then it is necessary to develop project requirements for individual units of equipment, or else a project requirement for the set, if it is covered by the definition cited in GOST 2.101-68.

It is also necessary to touch upon the testing procedure for test items (test batches). The composition of the commission must mandatorily correspond to the requirements of the project requirement. The acceptance tests of a component part of the item which is subject to independent delivery, can be performed when testing the item as a whole. In this case it is recommended that the acceptance certificate indicate the component part. Performing acceptance testing in sequence in the form of departmental and interdepartmental tests is not allowed.

A significant feature of placing items in series and mass production is the necessity of producing an adjustment series. If the volume of the adjustment series is not specified in the acceptance certificate, it is then determined by the producer enterprise. In contrast to the requirements of GOST 15.001-73, the RTM contains a mandatory requirement for testing the prototype unit of the adjustment series. For this reason the absence of a corresponding entry in the acceptance certificate does not relieve the producer enterprise from performing this type of testing.

A feature of the development and placing of repeated single items in production is the absence of an adjustment series and periodic tests, which must be reflected in the technical specifications. In doing this the letter "O_1" does not change in the process of production of the item. The technical specifications for this type of products are not subject to State registration. They must indicate (on the basis of the project requirement) that the item is intended for repeated single item production. This entry is made following the description of the purpose of the item such as: "Production of a sausage filling machine as an item of repeated single item production is implemented on the basis of acceptance certificate..."

A distinctive feature of the development and placing in production items of one time production is the absence of test items, and as a consequence, the absence of acceptance testing. Recently the NPO Lenmyasomolmash has been often approached as an RTM developer with questions related to the fabrication of items for the enterprises' own needs. Such items belong to the class of items

of auxiliary production, therefore in our opinion the procedure for their development must be established according to the standards of the enterprise, and the functions of customer, developer and producer must be assumed by the appropriate subdivisions of the given enterprise.

The introduction of RTM in no way resolves all the questions faced by the developers of technical documentation for equipment. Remaining unresolved is the question of timely delivery of all newly applicable sector documents, as well as changes in current ones, to the project design organizations of the USSR Minmyasomolprom and the minmyasomolproms of the Union republics.

A great hindrance to compliance with all requirements of GOST 15.001-73 and RTM 49-09--81 is the lack of a base organization within the Mininlegpishchemash system for the standardization of auxiliary equipment, other than the production group assigned to the NPO Lenmyasomolmash. The main organization, VNIIEKIprodmash [All-Union Scientific Research and Experimental Design Institute of Food Machinery-Building], does not resolve these questions.

The experience of development and expert examination of design documents shows that far from all reserves have been used up for improving the system of development and placing in production of machine-building products. Special attention should be devoted to reduce the time needed for the development and adjustment of the process of producing new products. For this reason, in our view, it is desirable to consider the following proposals: reduce the number of organizations coordinating design documents, beginning with the project requirements and ending with technical specifications; simplify the procedure for developing the simplest items (consisting of 3-5 parts), permitting the development of design documents without project requirements; grant the acceptance commission the right to accept an item with deviations from the project requirements, when these deviations do not reduce the effectiveness of using the item; and establish a procedure for repeated production of items of one time single item production.

The implementation of the indicated proposals, in our opinion, will in the end promote the quality improvement of equipment developed and produced within the system of the USSR Minmyasomolprom and the minmyasomolproms of the Union republics.

2208
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IMPORTANT RESERVE FOR ACCELERATING SCIENTIFIC AND TECHNICAL PROGRESS

Moscow SOTSIALISTICHESKIY TRUD in Russian No 6, Jun 84 pp 106-108

[Article by D. Sotnikov, chief of the marketing information department, "Mosgorelektropriborsnabsbyt" [Moscow City Electrical Equipment Supply and Sales] Administration, and Yu. Petrov]

[Text] The discussion carried on in the periodical SOTSIALISTICHESKIY TRUD on ways to accelerate the implementation of scientific and technical developments, which was initiated by the article by P. Volin "Autonomously financed introduction firms are needed after all," is very important in our view. After all, it is clear to everyone that increasing the return from scientific and technical creativity is the main reserve for speeding up the growth rate of socialist production and of its efficiency. This is not an easy task, of course. The process of introducing the achievements of science into production is a complex one. Basically it consists of such stages as the study (discovery) of a demand for one development or another, development and elaboration of the idea to make a device (process, substance), expert consultation (legal, technical, economic, etc.), construction of a model and its experimental testing at a materials technology center and fine-tuning it to an industrial test piece level, development of series production technology, organization of production using this technology, marketing of the product, and arranging for operational maintenance (including warranty and post-warranty repair, check-out, installation, adjustment and operator training).

In passing through these stages, the developments and inventions, even if they are being developed in accordance with the plan, must also overcome a number of bureaucratic barriers. It is even more difficult for non-plan inventions to negotiate this course. This is why a need exists for a comprehensive solution of the problem, which would make it easier to determine the degree of importance of proposed innovations and speed up their road to production.

With increased production volume and rapidly appearing new products, there is a need for a constant and diverse search for scientific, engineering, technical and organizational solutions by the united efforts of scientists, specialists, inventors and creative people. Economic managers, officials as well as creative workers need an advisory, consultative and expert institute or some kind of extra-departmental scientific institution with a high level of judgmental objectivity. As a rule, a multitude of "orders" arrives from the

managers of enterprises to develop an idea. And they require quick and objective replies. The solution of complex, inter-sectorial, major scientific, technical and economic problems raises the necessity to create a mechanism for a rapid and constantly functioning amalgamation of the efforts of scientists and specialists from various sectors of the national economy. The participants in the solution of such problems strive to establish effective, informal and multilateral creative ties.

Between the stages of developing the "creative products" and their use in practice lies the stage of public recognition of the usefulness and necessity of a given idea or proposal. These aspects require the existance of such organs that would make it possible to best serve the natural demands of the carriers of public opinion. There arises an objective need for action by organs and organizations possessing the ability and opportunity to create the optimum conditions for this. Among these would undoubtedly be scientific and technical councils of the academies of sciences and departments of the State. But due to their purpose to be councils of the "last resort," whose decision as a rule is the final one on the way from an idea to production, they can function effectively only in the presence of a kind of "first resort" scientific and technical councils. These could be coordinating councils to assist in the attainment of one special-purpose goal or another, specialized shops for the introduction of inventions, introduction firms, certain subdivisions of VOIR [All-Union Society of Inventors and Innovators] and NTO [Scientific-Technical Society], which would link the idea with its application, and finally the scientific, technical and production associations, and marketing and trade associations (NTP and STO) which we propose as links in the State system. The main thing is that these organizations would possess a material base for advancing developments and inventions to the stage of industrial production. After all, the authors of inventions or developments can fabricate and test only an experimental sample, model or mockup at best. They have neither the means nor the appropriate equipment to do more.

This in our view is one of the causes of the tilt appearing in recent years toward the use of minor innovations, as a rule involving insignificant improvements on functioning equipment or technological processes. At the same time the introduction of technical developments permitting the attainment of important qualitative improvements in production and a rise in its effectiveness drags on, occupying an ever decreasing relative place in the total mass of innovations.

The issue of financing new developments and providing incentives for the work of inventors and innovators is a bottleneck in the chain "idea--production." In our view, there are several reasons for this.

First of all, the lack of sufficient economic incentives for the introduction of inventions at enterprises if the savings resulting from the introduction of the innovation accrue not to the producer, but to the consumer of the product. In such cases the introducing side has to bear additional expenses for the organization of production, acquisition of equipment, for experimental work etc., for which it receives no compensation whatsoever from the consumer.

Second, the lack of sector and inter-sector experimental bases where any invention needed by the national economy could be brought up to the level of an industrial sample, and the element of risk in its introduction and production reduced to a minimum.

Third, the lack of the necessary planning at all levels in regard to the introduction of inventions. With the exception, of course, of a part of the most important inventions, the utilization of which is included in the State plan.

The introduction of inventions and setting up production of qualitatively new products on this basis require reserve production capacities and labor resources, for which there is no provision at enterprises, and for this reason new equipment often has to be pushed through, in the full sense of the term, expending an irrationally great amount of effort and time.

In addition, the achievements attained on the basis of inventions do not immediately influence the indicators of an enterprise for the better, but only after series production has been set up. Expenditures, however, are entered on the balance sheet immediately.

As we see, each link of the chain taken by itself is for one reason or another insufficiently interested in accelerating scientific and technical progress.

Experience shows that many enterprises would be more willing to undertake introduction of inventions if the developments were brought up to the stage of readiness for starting up industrial production. Thus there is a need for an intermediary connecting link, that middleman, who would develop an invention from an author's certificate to an industrial prototype.

In principle, large scientific-industrial associations are charged with solving this problem, but they are busy with sector developments previously included in the plan, and first of all, they are not interested in tackling non-plan innovations, especially those of inter-sectorial importance, and secondly, they lack the resources.

As a way out of this situation, in our view, it would be advisable first of all to organize an "Invention utilization fund" at the VOIR central council. The financial means of the fund would come from part of the profits received by enterprises from using inventions, which would be deducted in a centralized procedure, and also from cash income from licensing arrangements for inventions which were assimilated with fund assistance. Its material and technical base would consist of the centers for the realization of inventions, as component parts of NTP and STO, which would develop the idea into an industrial sample. The center would include project design subdivisions, plants (shops) for the fabrication of experimental specimens and the development of series production technology, testing stations (grounds), etc.

The centers will receive the necessary bank loans, and repay them out of the incoming profits after the invention has been assimilated in industry. Fees paid by used enterprises can serve as an additional source of financing. As such a system is developed, some promising innovations which had not found a

manufacturer could be produced by the centers directly. And these would receive a part of the income from the sale of these inventions.

There exists a real possibility to quickly overcome one other cause of the weakness of the material base for inventions. In contemporary scientific research and experimental design projects (NIOKR) in the ares of physics, chemistry, biology, engineering, materials science etc., a rapid growth in available instrumentation can be observed. Intensive use of advanced scientific equipment by highly qualified scientific and engineering personnel leads to an increase in the volume of scientific and technical information and to progress of the national economy. Instrument building and foreign trade organizations strive to satisfy the needs of NIOKR in equipment which becomes increasingly complex and also more expensive. The cost of some instruments reaches hundreds of thousands of rubles. Economic studies in the area of NIOKR organization in the country show that there are not enough instruments, especially unique ones to satisfy the needs of scientific organizations. And this is despite the accelerated rate of their production. At the same time instruments, especially unique ones, are underutilized. For this reason, in connection with the further growth in the number of scientific experimental projects, their size and the amount of instrumentation available to them, the necessity has arisen to organize new forms and methods of supplying instruments for scientific experimentation. To do this, in our view, measures should be takes to expand the network of centers for collective use of scientific equipment. In our rental equipment organizations the utilization factor for scientific instruments and equipment is 0.5-0.6, compared with 0.2 with traditional use in scientific establishments.

But more should be done. We propose that a new type of autonomously financed organization should be established and attached to the scientific, technical and production associations and to marketing and trade associations, with the following functions: placing material facilities at the disposal of researchers or inventors for conducting NIOKR, carrying out research or testing using the association's staff according to customer order, consulting with specialists or individual innovators on questions of scientific equipment use and scientific research and testing methods, sending out visiting experts, training specialists in the practical use of equipment; scientific information activities with advertisement of the newest instruments and their possible use, maintenance of the material facilities in good working order, as well as a number of other no less important functions, including implementing scientific achievements in practice.

In developing series production technology to meet production requirements, and for production itself, NTP and STO should use a modular structure and flexible production systems, which are easily restructured for the production of one type of output or another, and which would operate around the clock without human supervision. A special marketing organ would be established to work directly with consumers. Accordingly, these NTP and STO subdivisions ascertain the demand for one development or another, and fully satisfy it. It is necessary to establish a special progress fund to finance all these operations of the process. The initial loan is issued by the Gosbank. The loan will be gradually repaid from profits, part of which will remain in the association.

The customer organizations ordering new goods can contribute their dole to the amortization of the loans. It is also necessary to devote primary attention to issues of training personnel for the associations. They should be trained comprehensively, within harmoniously working brigades, with a new psychology, and knowledge and skillful use of the latest equipment for specific projects. This refers not only, and not so much, to production workers, but to specialists in all stages of the process.

Such a system, based on close integration of science and production, will make it possible to carry out the development of all scientific ideas on the level of the contemporary requirements of scientific and technical progress and give the opportunity to promptly inject the introduction of major new inventions, especially those of an inter-sectorial nature, into plan channels. This would activate an enormous reserve for accelerating scientific and technical progress, increasing production growth rates and efficiency, and further advancing national prosperity.

2388
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LINKAGE OF SCIENCE AND PRODUCTION VIA NPO

Moscow MOSKOVSKAYA PRAVDA in Russian 7 Aug 84 p 2

[Article by Candidate of Economic Sciences M. Bashin: "Bridges From Two Shores"]

[Text] Bridges of various designs have been built from the science of Moscow to production, but their carrying capacity is still limited. Only naive people think that a high-speed route was made for a novelty. As a matter of fact, the asphalt on its roadway is often turned into potholes and a vehicle tugs up to its very hubs.

The formation of scientific production associations (NPO) is eliminating this acute problem to a considerable degree. They are called upon to solve a dually unified task: to work out scientific problems, to create designs, to check them experimentally and, finally, to set new items into production in conjunction with plants. The scientific and technical base of the association is more improved than by industry on the average. Thus, the capital's NPO's are widely using the newest physicochemical research methods, a laser and microplasma welding process, and robot technology.

A feature of the NPO's is complex problems. Their organization was most advisable in industries with a long cycle for creating new technology. Here they are powerful catalysts of technical progress and they materialize scientific ideas and progressive manufacturing processes. A big effect is being achieved--assimilation time is being reduced on an average to two-fifths [of its previous level]. This is an important item in the strategy of implementing scientific searches and major inventions. In Moscow out of the total number of product descriptions with the state emblem of quality over 70 percent were created in NPO's. The output of competitive products on the level of the best world models is increasing.

The decisive component of success in assimilating a new item is the presence of a high-capacity experimental base among those working in development operations. It provides for creating a pilot model, working out the future manufacturing process, preparing technical specifications and taking into account the conditions of the plant of manufacture. But even in the NPO's this base is still weak, and in the industrial NII [scientific research institutes] and KB [design bureaus] it is all the more weaker. As a result, the assimilation

periods for new items are becoming longer and incorporation is being taken out from under the supervision of managing organs.

All the burdens of assimilation often rest on the shoulders of the production workers. Let's be fair. In many cases, the inclusion of a "braking unit" by the plant workers in the movement mechanism of a new item is justified. They see that the proposed new item is far from being a "firebird" in its technological qualities, but is rather a cuckoo that promises a restive life.

The formula for getting an enterprise interested in a new item is a concise one: the project's technological qualities, it ability to work towards the plan, improvement of the enterprise's final results, competitiveness in the world market, and material stimulation of the manufacturers' efforts. Legitimate demands of production! In practice, one or several components is often missing in this formula too.

Assimilation is most vulnerable if the new item is on a large scale and is of an intersectorial nature. Then the harvest of the "golden fruits of science" is sharply reduced. The "braking system" has a particularly successful effect on the junctions of industries.

Inasmuch as the operating mechanism for assimilation is aimed at localizing efforts within the limits of an industry, the long-range scientific results of other industries prove to be a sealed matter. They are forced to begin the long road of assimilation not only through their own efforts, but also from initial points of reference. In particular, this pertains to the comparatively new trends of technical progress.

Let's name some of them: powder metallurgy, plasma processing of metals, a manufacturing method of welding with a microburst, robot technology, automation of the control process, waste-free manufacturing methods, and others. In the long term, the number of trends of this kind will increase, and this is one of the conformances to the principle for accelerating scientific and technical progress. Just what is to be done? The complex problem can be solved only while building bridges from two shores--science and production.

Some economists see the way out in organizing special incorporating firms that supposely are capable of taking the entire burden of assimilation on their shoulders. According to the idea, a firm of this kind can become the active mediator between the opposing parties and perform the full volume of operations in accordance with the contracts, including the setup and placement of any new item into production. The main argument in defense of firms of this kind is the limited resources of the enterprises and the personnel shortage among them.

In our opinion, it is inadvisable to create one more management link. Further, the assimilation of new technology requires not only working out the manufacturing process, replacing basic equipment and often modernizing the enterprise, but also setting up a new and extremely inertial system of material and technical support. Such a complex of responsibilities for a firm is beyond its powers.

A scientific idea, however fruitful it may be, is only an impulse and the energy of a launching burst for future realization in production. In his time, Academician M. A. Lavrent'yev correctly emphasized: "Only people who created it and know it first hand can introduce an essentially new idea in industry. A lack of understanding of the profound essence of a discovery forces one to proceed along the path of partial assimilation, when one attempts to sew the heart of a new idea to the body of an old one."

It will be recalled that the scope and effectiveness of activities of scientists from FIAN [Physics Institute imeni P. N. Lebedev] and the Electric Welding Institute imeni Ye. S. Paton are supported by the organic continuation of their research and development through direct participation in the assimilation of new items. An active and progressive form for putting into metal the results that are obtained in sectors of the national economy is a successful strategy of their collective.

The idea of creating incorporating firms is an acknowledgement of the inability to convert the assimilation of new items into a natural process, which should be understood as active participation in it by both parties--science and production--without travelling salesmen.

The formation of several hundred new firms (and not to manage with a lesser number within the scale of the national economy) will inevitably divert a large contingent of skilled specialists from the realm of creating new technology. It will be recalled that the creation of assimilating firms was not stipulated by the CPSU Central Committee and USSR Council of Ministers decree on "Measures for Accelerating Scientific and Technical Progress in the National Economy." It is economically more expedient to direct large investments, which are associated with organizing new management structures, towards strengthening the experimental bases of NPO's, NII's, KB's [design bureaus], and particularly in the plant sector of science. These costs are rapidly repaid.

Analysis has shown that the organization of specialized assimilation sections within the structures of NPO's, large NII's and KB's pays for itself.

Areas for using progressive technology are rapidly expanding. As a rule, they are of an intersectorial nature. The incorporation of them by industries on the basis of their own "natural economy" usually leads to appreciable economic losses that are connected with duplication of planning operations, fragmentation of production capacities, and delay in time frames for creating nonstandardized equipment. As a result, the level of an industrial project is sharply reduced, the time frame for its assimilation is increased, and the economic impact of the new item turns out to be below the standard one.

The solution is connected with overcoming a stereotype that has arisen, and one on whose basis the transfer from industry to industry of only the components of technical specifications for a new item is laid. A highly compensating economic mechanism that stimulates the transfer and, more precisely, the sale of the entire sum of accumulated industrial experience of one industry to another is required. A well-founded payment is necessary for the results of accumulated scientific and technical potential, for the skills of "what to do and how to

incorporate," for participation in the process of incorporation that is being performed by the skilled personnel of the transferring industry and, in short, for the entire sum of services that contribute to the effective assimilation of a new item. This sum must include encouraging markups for high final indicators.

Life prompts a real necessity to resolve one more matter. The incorporation of something new requires the coordinated efforts of a group of industries. They are faced with assimilating hundreds and often thousands of new materials and fully complete units and blocks and, moreover, ones that come up to the standards of the best world achievements according to the new specifications. The head organization, which is responsible for assimilation, often finds itself in a critical situation. There are attempts to eliminate the danger of disrupting the established assimilation time frames by reducing the exacting requirements for fully complete units and manufacturing solutions. One shouldn't be surprised if the final product of this kind of "cooperation" is "new" technology in name only. It is not economically effective in the national economy and it is not competitive on the world market. Under these conditions, the responsibility of head organizations must be sharply increased for the final scientific and technical characteristics of a new item. The current standardized formal documents, which regulate the complex incorporation process, are still not a unified and completely worked out system that encompasses a large number of organizations of diverse standards and departmental subordination. It may be that the USSR GKNT [State Committee for Science and Technology], with the participation of interested departments, needs to work out the "Statute on the Procedure for Incorporating the Achievements of Science and Technology into the National Economy" which contains a precise definition of the duties, rights and responsibilities of all participants in this most important matter.

9889
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EVALUATION OF LABOR AT RSFSR MEDICAL INSTITUTES

Moscow MOSKOVSKAYA PRAVDA in Russian 24 May 84 p 2

[Article by A. Antonov: "Find an Accurate Measure"]

[Text] How is the labor of a scientist to be evaluated? Is competition in science possible? Is it possible to take into account the quantity and quality of labor, if one has to wait at times several years for the results? What criteria are to be chosen?

The importance of the direction? Of course, the institute, which is studying the problems of oncology, also does, perhaps, more important work than the institute, at which they are seeking effective means of treatment, but not of such dangerous diseases. However, what is to be done if the latter in contrast to the formed has found these means? Being ahead of the planned deadline? In science this is far from always of benefit. Research has its own logic. New materials and new experiments can suddenly be needed. And what if such results, for the explanation of which additional time will again been needed, emerge?

The search was crowned with success. Workers of the Department of the Organization and Economics of Scientific Research of the Moscow Scientific Research Institute of Epidemiology and Microbiology imeni G. N. Gabricheskiy were the authors of the system of the evaluation of the activity of scientific research institutes. MOSKOVSKAYA PRAVDA told about the beginning of this work 10 years ago in the article "The Weighty Point" in the issue of 16 January 1974. At that time these were only outlines, plans. And now the system, which was approved by the RSFSR Ministry of Health, has already begun to operate and has yielded its first results.

From what did the authors of the system proceed, what tasks did they set for themselves before finding efficient and effective criteria and assigning the processing of the obtained information to a computer, which should identify both the best and the lagging ones? In all 40 indicators were determined. They divided them into four groups. The first and, most likely, most important one of them is the one which concerns scientific effectiveness. Here the number of dissertations, authorship certificates and articles and the frequency of quotation are taken into account. Of course, people may reply with good reason that quantity by no means replaces quality. But such an

important indicator as the level of scientific informational value was also included in the first group precisely with allowance made for this.

The most important, but, perhaps, also the most complicated one. How is this value to be determined? It is to be determined objectively, fully and comprehensively. For this they developed ordinal scales of the two most important parameters of scientific informational value: the level of theoretical profundity and the degree of novelty. A conditional weight (point) characteristic was assigned to each step of the scale.

For example, the level of theoretical profundity is characterized by the description of individual, elementary facts and an account of the experience, observations and results of measurements. All this is given a rating of one point, while the thorough elaboration of a problem (the multi-aspectual analysis of ties, the interrelationship of facts with the availability of an explanation) is given a rating of four points.

As to the degree of novelty, here the parameters are the following: for example, if a result, which was previously recorded in the data file, but was not known to the author, has been obtained, this is given a rating of one point. But if new information, by means of which known facts and laws have been explained for the first time and new concepts have been introduced, has been obtained, the evaluation is increased.

The value of a scientific document is determined by the expert method, by a special commission of the given scientific research institution.

The indicators of scientific effectiveness are the most important group, but far from the only one. In itself it will not give a complete idea of the work of a scientific research institute. For it is important to know how, for example, the process of introduction is proceeding, what the social indicators are: the sick rate of the staff members, the accident rate, the turnover of personnel, the amount of the allocations for labor safety procedures, the improvement of working conditions. Of course, all this influences the quality of work. The group of social indicators helps the management of the scientific research institute to find an explanation for the incomplete effectiveness, to answer the question of what to begin the improvement with.

The first official evaluation of the scientific research institutes of the RSFSR was conducted in 1982. It is pleasing that mainly institutes of the capital were among the 10 best. The Moscow Institute of Eye Diseases imeni Gel'mgol'ts took first place.

Thus, a system of evaluation has been found. And, of course, it is impossible not to mention the people, who worked persistently and diligently on it and who now have to work on the numerous data being received from the entire RSFSR. Junior scientific associates O. Aleynikova, A. Rubacheva, Ye. Sklyarova and A. Allakhberdyan and Candidate of Medical Sciences V. Libenson, the chief of the department. Now they are processing the obtained information and are making a sample check. For example, any scientific research institute, in indicating the number of articles in scientific journals, is obliged to specify what kind of articles these are and where they were

published. The workers of the Department of the Organization and Economics of Scientific Research verify the existence of these works and also strictly evaluate other data.

Let us add that although the role of computers is great, all the same people make the final evaluation. A special commission headed by Deputy Minister S. Chikin exists in the RSFSR Ministry of Health. The data obtained by computer are carefully studied by the workers of the Main Administration of Scientific Research Institutes and the Coordination of Scientific Research, which is headed by Corresponding Member of the Academy of Medical Sciences B. Velichkovskiy, and serve as the basic source of information. The collectives of the best scientific research institutes receive messages of appreciation and incentives. The organizations, at which serious shortcomings have been revealed, are obliged to draw up plans on their eliminations and to report to the ministry on the taken steps.

The work has just begun. And, it seems, it would be more productive, if the authors of the new system would not have to be faced at times with many difficulties of a technical nature: there is no direct telephone service with other cities, and this is complicating contacts with institutes of other cities. A quite significant number of institutes is attached to one worker, which, of course, affects the conducting of comprehensive and thorough monitoring.

We hope that the developers of the new system will receive everything necessary for their activity, because of which it will become more efficient. The extensive dissemination of the new method of tallying the results of competition in scientific collectives to a considerable extent depends on this.

7807
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ATTITUDE OF SOCIETY TOWARD SCIENTIFIC, TECHNICAL PROGRESS

Vilnius SOVETSKAYA LITVA in Russian 11 Aug 84 p 2

[Interview with President of the Lithuanian SSR Academy of Sciences Yuras Karlovich Pozhela by SOVETSKAYA LITVA correspondent L. Filipavichene: "Today and Tomorrow, and..."; date and place not specified]

[Text] The theme of today's interview, which our correspondent L. Filipavichene conducts with President of the Lithuanian SSR Academy of Sciences Yuras Pozhela, is society and scientific and technical progress. It is very broad, you say? We agree, even more it is boundless. In it there is everything--the development of the sciences, their interweaving, the mighty "explosion" of technology, the automation of production and the development of man himself. Therefore, it is difficult to speak about the "turns" of the conversation even now, when its basic lines have been thought out and the conversation is beginning.

One thing is certain--we will try today to speak with the physics scholar and president of the Academy of Sciences "on equal terms"--no, unfortunately, without having risen to the labyrinths of scientific thought, but having asked him to come out for a minute from these labyrinths and to speak with us on the proposed theme in popular language.

[Question] "Progress" means "movement." Optimism simply blows from this very word. Can you and I, Yuras Karlovich, to start with develop a simplified diagram of movement--progress?

[Answer] Let us try. Thus man always went up. Imagine that you are going up an incline. It is difficult! Man went that way for many millennia. He took the first steps on the "ladder" with a stone and stick in his hands, now he "flies" in a satellite with a nuclear engine. He himself creates "speeds," but they are accelerating progress more and more. But, the main thing is that man is growing continuously together with the creations of his hands. His labor and thinking are becoming more and more perfect. Science, industrial production and all other, if it can be said this way, phenomena of progress are rising higher and higher on the ladder. (For example, the number of

today's scientists in the world comes to 80-90 percent of all the scientists who have every lived in it, and every 10-15 years their number doubles. Or take the following data: in the last century not less than 50 years were required so that some discovered would be used in practice. Then this period was shortened to a decade. Now any major discovery is introduced in 1.5-2 years.) In short, man is carrying his achievements with hands raised high. Figuratively the brief history of progress looks approximately that way. But it would be distorted and "colorless," if we did not consider that man himself has developed socially. Society has been divided into classes, having given rise as a result to the most progressive one--the working class.

[Question] In his day, they say, Aleksandr I placed a ban on the word "progress." Of course, not the word itself frightened him. The new, revolutionary trends, which had inevitably progressed in his state, frightened him. Even today many philosophers of the West "err" toward this fear. The world press incessantly reports their pessimistic conclusions to us. Our readers hear these conclusions and at times also believe them. There are in the mail to the editorial office letters, in which the authors "accuse" progress of many of the misfortunes of mankind and give reasons for their position. Let us try to investigate these arguments together.

At one time on the instructions of U.S. President Jimmy Carter in America they studied the probability of changes in the nature of the world and human society up to the end of the current century. The report "The World in 2000" was published in 1980. It is noted with anxiety in it that the time for the taking of steps is running out..., that mankind "will be in a tight spot" already at the beginning of the 21st century.

Scientists, writers and sociologists have echoed these conclusions in different ways. Some have "weighed" living people and arrived at appalling prospects: if we give birth in the future at such rate, after some millennium and a half the weight of people will exceed the weight of the earth. Others have analyzed with agitation the growth rate of mankind--and it turns out that in 50 years (English historian Arnold Toynbee made the calculation in 1966) the frequent theme in ancient Roman epitaphs "Migravitad plures," when they grouped the dead with the majority, may turn out to be incorrect. In other words, the number of all our great great ancestors will be less than all the people living on earth.

As we see, one haunting refrain is heard: a catastrophe is need and is almost inevitable. But "doomsday" is being postponed from day to day.

The scientists of the West, obviously, are making correct calculations, you will not deny them scrupulousness. But, what do you think, Yuras Karlovich, is this pessimistic, if one does not say "black" note in their interpretation justified?

[Answer] In my opinion, this is an example of how it is possible to modify statistics. A person, who is confident of his own economic strength (who bases himself on a planned long-range economy), is always optimistic and is convinced that his achievements are being used for the improvement of society and for the good of mankind. For him, let us assume, a high birth rate is

good, since each new member of society is new hands, intelligence, a creative potential and so on. While the person who is not confident of tomorrow.... He will simply panic and be horrified. Both his will and reason will be broken, and the tormented person may perceive as proper the statement that in the world there are things "a bit more important" than thermonuclear war. It will not even arouse in him the desire to resist. So that a pessimistic view of the progress of science and technology is justified first of all from the point of view of imperialism and bourgeois ideology.

Society develops owing to the activity of people. Conscious activity, and, therefore, any progress, which occurs in society, is controllable. Everything depends on man--in both the large and the small (if we take a quantitative census), as well as in the good and the bad (if we take a qualitative census). On his understanding of the goals and possibilities. We have different goals and aims than capitalism. In socialist society, the slogan of which is humanism, the interests of man and society act as the criterion of everything. We know than both today and tomorrow and... while mankind exists, the greater and greater flourishing of science and industry, culture and the personality of man himself awaits us. The people in the capitalist countries do not have this confidence. Do not have and cannot have. Hence, too, the differences in the approach to specific global problems--war and peace, environmental protection, the nature of scientific achievements under socialism and capitalism. Hence, too, the variety of views on progress and discordant notes in all the processes of the development of society.

[Question] And still, Yuras Karlovich, if we even look at things from our optimistic point of view, the amount, for example, of petroleum in the world actually is not increasing, but is decreasing. Today its proven world reserves come to 1.4 trillion barrels. It seems like a lot. But it turns out that given present consumption our generation of people will lose this energy source. This is on the one hand. On the other, by using it, man like it or not is going "counter" to nature, contaminating the environment with waste products and so on. Here you will automatically believe the pessimistic forecasts of our opponents in the West.

[Answer] These objections are irrefutable only at first glance. Our opponents, like you said, either do not notice or rather deliberately do not recall that the possibilities of mankind are increasing. Atomic energy was the greatest discovery of the 20th century. Today hundreds of nuclear electric power plants are in operation on the planet. And at one time thermal electric power plants were an innovation for us. Here are two landmarks of scientific and technical progress for you (which are in the immediate vicinity of us)--the thermal electric power plant in Elektrenay, which was advanced about 10 years ago, but burns every day two to three train-loads of fuel oil, and the nuclear electric power plant in Ignalina, which is completely "clean" and is equal in the capacity of just one reactor to three Dnieper hydroelectric power plants.

But mankind is already "stepping" toward the rung on the ladder of progress, which is called "the harnessing of thermonuclear energy."

Lithuanian scientists are also now working in the area of thermonuclear energy. We are proceeding along a path which promises the discovery of new sources of controllable nuclear energy. I should stress that controllable nuclear energy is an exclusively "peaceful" atom. This is not a bomb. This is the opposite--the solution of the problem of preserving the energy resources of the world.

However, if you and I are to speak in such detail, we will have to talk for many days.

[Question] Yes, we have "digressed" somewhat from the theme. Although it would be possible to talk and talk with you about the progress of science itself. But the broader view of the scientist interests us. For every scientist is a philosopher. When developing something new, he grasps like it or not all the aspects of the surrounding world, society and human nature. A comprehensive view of the world, a philosophical view, is developed in him gradually, but, it seems to me, is developed without fail and serves him as firm ground for the alteration of this world. Is this not correct? People very often, when thinking about the atomic bomb, "chastise" with their contempt the scientists who discovered atomic energy. But are scientists to blame? Perhaps, being carried away with a discovery, they forget about the polarization of minds and spirits in the life of society?

[Answer] I agree with the concept: the scientist is a philosopher. A person, when engaging in large-scale science, should not only see the specific goal of his labor, he should know what it is aimed at in the broad sense. But the scientist is the child of his society, with all its aspirations. The fruits of his research pass to society. But how does it manage them? It manages in such a way that, on the one hand, the harnessed atom is "the greatest triumph of reason" and, on the other, Hiroshima, which was turned into a graveyard, which is also an imprint of civilization. The "imprint" in case of the TNT equivalent is only 20 kilotons. Today's atom bomb and the intercontinental ballistic missile are 500 times more powerful. Is this progress? Here are two polar figures for you--in the past 100 years energy resources have increased by 1,000-fold and the power of lethal weapons has increased by 1,000,000-fold.

"Man is the measure of all things," ancient wisdom states. It is the basic goal of genuinely progressive science to alleviate the burdens of the existence of man. To make mankind happier--not one person, not two, but namely mankind!

It is safe to say that our age has been characterized by the rapid development of physics and chemistry. Progress manages in conformity with certain laws--first one science, then another breaks ahead, and the others support it in every way. Biology will undoubtedly be the leading science of tomorrow. Mankind now needs it most of all, taking into account the global problems, about which we spoke above. The latest achievements of biology, especially in the field of genetics, have afforded the scientist of breeding previously unprecedented possibilities. Man has become a magician, having learned to speed up the processes of evolution. Nature, in improving some qualities of a plant and animal, spent thousands of years. Man has shortened this process by

hundreds of times. It is possible to cite examples here endlessly--these are new strains of highly productive plants, the increase of the yield of crops, the sharp increase of the birth rate in animal husbandry and the combating of various diseases, including the most frightening one--cancer.

In short, the horizons of biology, including the "green revolution" which is now gathering momentum around the world, are boundless. But this is again on the one hand. While, on the other, each year in the world, and you know yourself, in the "camp" opposed to us, approximately the same number of people die from starvation as were killed in a year during World War II. You would explain this only by the unfavorable climate of such a kind as the social climate. In case of which the direction of the production of material wealth and its distribution desire much that is better.

[Question] Hence, when they speak in a pessimistic tone about the development of science and technology, they see before themselves first of all the negative results. But man, their creator, consumer and distributor, remains "in the shadow." Meanwhile precisely he, with his moral basis, is a friend or an enemy of progress. This is the central figure of all Marxist sociology when attempting to understand the essence of progress.

[Answer] You are right. Man is the motive force of progress. The "breaking through" into space and the "plunging" into the depth of the ocean and the interior of the earth are to his credit. But, I repeat, all the activity of man is socially governed. It is the simple truth, but it is heading toward its own victorious affirmation by a long and difficult path. However, history is on our side. The rapid growth of precisely the socialist system proves the correctness of our optimism. For even the fact that the scientific and technical revolution has encompassed not only the socialist, but also the capitalist states, bears consequences which are fraught for the latter. Precisely the scientific and technical revolution is "displaying" more and more the disorders of capitalist relations--economic crises, hunger, unemployment, the death of people in wars. For Lenin stressed: "This progress is accompanied, like all other progresses of capitalism, also by the 'progress' of contradictions, that is, by their aggravation and spread." A natural historical process is occurring: a progressive system--socialism--is maturing more and more in the depths of capitalism. Mankind is standing on this, while the time.... It will constantly speed up, according to the formula of the acceleration of progress in general, which was deduced by us at the very beginning of our conversation.

7807
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SOCIALIST COMPETITION AS FACTOR IN SCIENTIFIC, TECHNICAL PROGRESS

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 8, Aug 84 pp 101-107

[Article by candidate of economic sciences M. Valitov: "Socialist Competition and Scientific and Technical Progress"]

[Text] Successful implementation of the party's course toward the intensification of social production presupposes increasingly extensive use of the achievements of science and technology in the national economy and a substantial reduction in the time taken to introduce them in production and an enlargement of the scales on which they are introduced. In his speech to voters in the Kuybyshevskiy electoral district comrade K.U. Chernenko said: "It is absolutely essential to insure rapid and continuous renewal in all sectors of the national economy on the basis of current achievements in science and technology."*

Along with measures to improve the economic mechanism, an increasingly role in resolving this task is being played by socialist competition.

At all stages in the building of communism, socialist competition has helped and is helping in revealing and bringing into play the major reserves in improving production efficiency. More than 112 million workers, hundreds of thousands of production and scientific collectives and millions of brigades are now involved in this patriotic movement. In the CPSU Central Committee decree "On Improving the Organization and Practice of Summing Up the Results of Socialist Competition and Rewarding the Winners," party, trade union, Komsomol and economic organs were set the task of focusing the efforts of those participating in competition on accelerating scientific and technical progress, improving labor productivity, improving output quality, meeting delivery obligations in good time, and making better use of production capacities, raw materials, and fuel and energy.

In recent years the acceleration of scientific and technical progress has become one of the main directions in competition among workers, kolkhoz farmers, engineering and technical workers, and the labor collectives. Participation in competition induces each worker to think creatively and resolve complex tasks in improving equipment, technology, and production

* K.U. Chernenko. "Narod i partiya yediny" [The People and the Party Are One], Moscow, Politizdat, 1984, p 10.

management. Only scientific and technical progress creates real opportunities for displaying creative abilities and talent. Under its influence the content of labor is becoming increasingly meaningful, the process of its intellectualization is being reinforced, and the individual--society's chief production force--is ceasing to be merely an appendage to the machine.

"Labor," K. Marx wrote, having in mind the broad intrusion of science into production and on this basis the automation of many of its processes, "is not so much part of the production process as it is a kind of labor in which, quite the reverse, man pertains to the very process of production as its controller and regulator... Instead of being the chief agent of the production process, the worker takes his place alongside it. "*

The mechanization and automation of production processes, and through this the reduction in manual labor, occupy a leading place in the socialist pledges of many workers, brigades, shops, enterprises, associations, sectors and regions, and they are taken into account during the summing up of labor rivalry and determination of its winners and the material and moral incentives offered them.

The purposeful work that is being done by the trade union and economic organs under the leadership of the party committees to develop socialist competition for the accelerated development and broad introduction of the achievements of science and technology is yielding positive results. Thus, of the 15,190 models of machines, equipment and apparatus developed during the period 1971-1975, some 13,300, that is, 87.5 percent, were assimilated and put into series production. During the 10th Five-Year Plan this indicator rose to 98 percent, and in recent years it has improved even further. The introduction of new equipment and the implementation of measures for the scientific organization of labor insured a 52-percent increase in industrial labor productivity during the period 1971-1975; in the period 1976-1980 the figure was 93 percent, and in 1981-1982, it was 100 percent. In 1982 the implementation of measures for the scientific organization of labor made it possible to save the labor of more than 300,000 people.

At the same time, no matter how substantial the results achieved, they give no grounds for complacency because those participating in competition sometimes lose sight of other problems that are just as important. Just take questions of economic return and the social effects of measures introduced. Thus, actual expenditures to introduce new equipment measures (including expenditures from previous years) increased from R9.7 billion in 1980 to R11.7 billion in 1982 (20.6 percent), while additional profit, calculated on an annual basis, rose from R3.2 billion to R3.6 billion (only 12.5 percent). And the total number of those workers freed up as a result did not increase but fell from 555,000 in 1980 to 450,000 in 1982. The annual saving derived from the introduction of new equipment during this period remained at the same level, namely R4.8 billion.

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* K. Marx and F, Engels. Works. Vol 46, part II, p 213.

Another important indicator--the realization of inventions and efficiency proposals--also remains quite low: only 76-80 percent of efficiency proposals and inventions submitted each year are introduced into production (for example, in 1982 only 3,963 out of 4,937 proposals submitted were actually embodied materially). The picture is similar with improved efficiency from the use of these proposals: over the past 3 years the saving from the introduction of inventions and efficiency proposals in production has been unchanged at R6.9-7.0 billion. It is also worth noting that a declining trend has been seen in the numbers of people who submit efficiency proposals and applications for inventions, falling from 4.7 million in 1980 to 4.6 million in 1982.

The negative facts described above once again underscore the need to use all levers to enhance the efficacy of all-union socialist competition to accelerate the industrial assimilation of the achievements of science and technology, improve the results from the scientific and technical creativity of the workers, and carefully study, generalize and disseminate in every possible way and introduce the experience of competition winners.

This kind of experience has been gained by labor collectives in Moscow, Leningrad, the Ukrainian SSR, the Belorussian SSR and other major industrial centers in the country. At the start of the 11th Five-Year Plan they took the initiative for insuring that all growth in production volumes would be through technical progress, maximum loads on equipment, and savings on all kinds of resources. This initiative is the logical development of the worker movement to raise the technical level of production and output quality, reduce lead times for the development and assimilation of new equipment, achieve all increases in production volumes with fewer numbers of workers and without increases in material and fuel and energy resources, introduce the brigade form of labor organization and incentive extensively, and strengthen labor and executive discipline.

One of the chief ways for enhancing the efficacy of competition is the broad development of cooperation between science and production at all levels of management. Thus, the Moscow Automobile Plant imeni I.A. Likhachev (the ZIL Production Association) does scientific development work with many scientific and production collectives on more than 500 themes. These collectives include those at the USSR Academy of Sciences institutes, the Moscow State University imeni M.V. Lomonosov, the Moscow Higher Technical School imeni N.E. Bauman, and dozens of sector scientific research institutes. The joint quest by scientists and production people has made it possible to accelerate the introduction of major scientific and technical development in production by a factor of 1.5-2.

The Kharkov Electrotechnical Plant (the head enterprise of the Ukrelektromash Production Association) has in essence become an experimental base for the All-Union Scientific Research Institute of Electrical Machine Building, which dispatches to the association shops redeveloped automated lines and complexes for handling the main assemblies of electric motors following appropriate checks and fine machining in the sections of the test production facility. This kind of direct combination of science and production has removed many of the barriers and restraints hampering the assimilation of new scientific

and technical developments and has reduced lead times from 5 or 6 to 2 years (and in some cases to 1 year).

The combination of science and production is not achieved in some automatic way but as the result of considerable interest on the part of scientists, engineering and technical workers, and workers in accelerating technical progress. Even at the development stage the cost-accounting brigades of creative cooperation made up of representatives of the association and the institute jointly seek out ways to improve all the characteristics of the new equipment and technologies. For all the subdivisions of the institute and the plant one of the main factors in evaluating the effectiveness of activity is the indicators that reflect lead times for the development and assimilation of new equipment and the savings made in material and energy resources. Each participant in socialist competition is assigned a monthly and quarterly task for making savings, and these are also included in the socialist pledges, the personal accounts for savings, limit cards and so forth.

Persistent work by the party and trade union organizations and the plant and institute administrations to mobilize the efforts of those participating in competition to make every possible saving helped the collective to cope with the task outlined for the end of the 11th Five-Year Plan in 1983 in terms of output growth rates and labor productivity, and without increasing the consumption of metal output. The plant's electric motors became less material- and labor-intensive (with the best indicators in the sector), and they were awarded a state mark of quality. Consumer goods made from the material resources saved are now being produced in a section that has also been staffed with its complement of personnel through freeing up workers.

Opportunities for the close integration of science and production are available in every enterprise. All that is needed is initiative, persistence, and the ability to mobilize the entire collective to resolve this crucial task. The experience of one of the leading enterprises in the bearings industry, namely the Saratov State Bearing Plant No 3, bears eloquent testimony to this. For more than 10 years a research center (a department for laboratory and research work), organized at the initiative of the collective by reassigning personnel within the enterprise, has now been operating there. The number of personnel working in the center totals about 90, and 30 of them are engineers while the rest are highly skilled workers. The center handles the development of unique new technologic processes. It includes a production section where new models of equipment are tested and checked. Thanks to the center's activity, each year 350 major organizational and technical measures are implemented at the plant. In the first two-and-a-half years of the five-year plan alone more than 800 developments coming from the center were introduced, with a saving of more than R4.5 million.

Most of the new technical developments at State Bearing Plant No 3 appear earlier than at the other enterprises in the bearings industry. And during the course of the introduction of scientific developments each worker and engineering-technical worker becomes an active participant in the creative process and transforms into reality not only the ideas of the scientists but also his own proposals. This in turn provides a stimulus for new creative search and for boosting the general educational and technical level of the workers.

It is emphasized in the CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress in the National Economy" that the USSR ministries and administrations, the union republic councils of ministers and associations, enterprises and organizations should proceed in their activity from the premise that in the coming years industry must provide output that in terms of its indicators is the equal of the best current models, and also introduce up-to-date technologic processes and on this basis effect a substantial increase in labor productivity in the national economy.

The workers and engineering and technical personnel at the Leningrad Elektrosila Production Association are making a substantial contribution in the resolution of this task. This collective is the invariable winner of socialist competition within the sector and has many times been awarded CPSU Central Committee, USSR Council of Ministers, AUCCTU and Komsomol Central Committee challenge red banners. The movement of inventors and innovators there is distinguished by its fine results. Each year, plans for raising productivity and saving materials and energy are worked out by virtually all the production brigades and as a rule the are completely fulfilled. The movement for cross-utilization of labor has been broadly disseminated in the association, and self-monitoring for the quality of operations carried out is being introduced. The measures to increase the workers' creative return make up an organic part of a comprehensive system of quality control that includes all stages in the development of new equipment. In addition, a system of certification for the level of production organization and technology operates in Elektrosila, in accordance with which each section is checked every 3 years for its conformity with the strictest current requirements. In all, during the last five-year plan 5 shops and 13 sections were comprehensively mechanized and automated. Each new article in turn is awarded its enterprise certificate, which indicates the basic quality characteristics, taking into account the best foreign and domestic analogues.

Questions of economy and thrift, improvements in output quality and the reliability of articles are central in the creative cooperation agreements that are systematically concluded between workers, engineering and technical personnel, brigades and association services. In accordance with these agreements, in 1983 alone more than 400 proposals resulting in a saving of about R6 million were realized. During the 10th Five-Year Plan all the hydroelectric units produced for GES's received a state mark of quality. The saving derived from the delivery of high quality equipment for the national economy amounted to R156 million during this period.

Much that is instructive can be found in the organization of socialist competition to reduce labor intensiveness for output at the Uralmash Production Association, whose collective stands in the front ranks of technical progress among the enterprises in the sector. Suffice it to say that by retooling throughout the 50 years of its existence the association has increased its original design capacities ten times over. In the last 7 or 8 years alone the rate of retooling has been such that 340 specialized and unit machine tools, NC machine tools, processing centers and so forth have been brought into operation.

Higher plan targets and the use of new equipment require highly skilled workers, and shortages of such workers have been increasing recently at Uralmash. And

so a search has begun in the association for reserves in terms of relative freeing up of workers, and most engineering and technical personnel are involved. Thus, in the chief technologist's department all specialists have been brought into this. Each engineer works up his own personal creative plan, in which provision is made for participation in lowering output labor intensiveness. This document also defines the engineer's measure of participation in socialist competition. Summing up of his results is done according to comparable, maximally concrete indicators, mainly according to the number of workers freed up. The course of fulfillment of the creative plan is monitored constantly by party, trade union and Komsomol organizations. This kind of consistent, purposeful work to develop competition among engineering and technical personnel made it possible for the department to free up 513 people during the 10th Five-Year Plan. Since the start of the 11th Five-Year Plan more than 150 people have been freed up. The initiative of the engineering department at Uralmash has been taken up by 15 sections, 3 branch plants and 50 shops. More than 500 engineering and technical personnel at the association have assumed pledges to save worker labor.

A smooth-running management system, which should motivate labor collectives and their leaders to seek out the new and the progressive, plays a decisive role in developing socialist competition for the accelerated introduction of scientific and technical achievements in production. Unfortunately, there are still frequent cases where a collective that has for the first time engaged in progressive and particularly large-scale developments has lost out. The measures envisaged in the CPSU Central Committee and USSR Council of Ministers decree "On Additional Measures To Extend the Rights of Industrial Production Associations (or Enterprises) in Planning and Economic Activity and in Enhancing Their Responsibility for Work Results" are largely aimed at overcoming this barrier.

As shown by the course of the economic experiment being conducted in five of the industrial sectors, in accordance with this decree, production associations and enterprises have been afforded broad opportunities to make independent use of part of the assets in the unified fund for the development of science and technology in order to do planning and design work on their own initiative to develop new equipment, and also to compensate for higher expenditures during the period of assimilation of new equipment. In these collectives more complete use is also being made of the rights afforded by the decree to managers in setting up scientific research, design, planning, planning-and-design and technologic organizations. With the permission of higher organizations they can now pay bonuses above the ceiling envisaged in existing regulations to scientific workers, designers, technologists, planners, engineers and other specialists who insure the development and production of output that in terms of quality indicators equals or exceeds the best world or domestic models and meets the long-term requirements of consumers.

This decree recommends that as experience is gained, progressive systems of material incentive should be introduced for designers and technologists for raising the technical level and quality of developments, and for completing larger volumes of work with fewer workers. This particular kind of experience has been gained by the collective of the Nevskiy Plant imeni V.I. Lenin

Production Association. The subdivision leaders there have been afforded substantially extended rights in using the specialists' wages fund confirmed for the period 1983-1985. The management structure has been reorganized, and also certification for designers and technologists. In addition, a new bonus procedure has been introduced. Whereas previously bonus funds allocated for the collective were distributed among all associates according to time worked and salary level, now the best workers in a subdivision are offered bonuses by the administration and the community. The size of bonuses depends mainly on the quantity and quality of the labor of each designer or engineer.

When assessing the contribution from a collective the indicators for fulfillment of the thematic plan for design, technologic and test work according to volume, nomenclature and time periods, and reductions in material- and labor-intensiveness of articles play a major role. Thus, for designers, the main thing is considered to be the degree of innovations and complexity of work, effectiveness, reductions in labor intensiveness, metal consumption and prime cost of articles, and observance of labor and production discipline. Additions to wages of R30 to R90 per month have been established for the best designers and technologists who show high results in competition. Contrariwise, workers who fail to justify the hopes placed in them do not receive these additions. All additions are made within the limits of the planned wages fund and through savings in this fund.

The new approach to the organization of and payment for the labor of designers and technologists has created an opportunity for enhancing the effectiveness of competition among them. During the first year of the experiment, labor productivity among these workers rose 12-15 percent, and the numbers of personnel were cut 5 percent. Technical documentation for the production of natural gas heaters was produced over and above the targets set, and moreover output had the best technical-operating characteristics.

A general realization of the requirements contained in the CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress in the National Economy," in which plan and task fulfillment in the development of science and technology is included among the most important indicators in the evaluation of results from the economic activity of associations (or enterprises) and the summing up of results in socialist competition, will play a major role in strengthening the influence of socialist competition on progress in science and technology. If given targets are not met or output is produced beyond the normativ time periods for its renewal (or modernization), the bonuses for leading workers at an enterprise for the main results of economic activity are reduced by at least 25 percent.

One important factor in the acceleration of scientific and technical progress is direct participation in socialist competition by the workers in science, scientific research establishments and planning and design organizations. And this is understandable: science is not only intruding into production, resulting in radical qualitative changes, but is itself being developed. Suffice it to say that more than 1.4 million scientific workers are now working in the country (in 1950 the number was 162,500), that is, one-fourth of all scientific workers in the world.

Expenditures for the development of science are also increasing rapidly: during the 9th Five-Year Plan they totaled R77.0 billion; in the 10th Five-Year Plan they amounted to R97.9 billion, and in 1981 and 1982 they grew to R23.4 billion and R24.6 billion respectively. This is more than 13.5 percent of the state budget. Under these conditions the intensive growth in science acquires special meaning, while the development of competition in science acts as a means for accelerating its growth.

The CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress in the National Economy" made it incumbent upon the State Committee for Science and Technology, the USSR Academy of Sciences, the union republic academies of sciences, and the sector academies of sciences to insure better results from research work and active cooperation on the part of collectives of scientists in the large-scale introduction of scientific achievements in production.

All-union socialist competition among the collectives of the scientific research, planning, technologic and design organizations and the associations and enterprises for successful fulfillment of the tasks set in the goal-oriented, comprehensive scientific and technical programs and programs to solve the most important scientific and technical problems during the period 1981-1985 offers reliable assistance in solving this task. Practice has shown that it promotes the mobilization of scientific collectives to develop and introduce new kinds and systems of highly productive machines and automated equipment and efficient technologic processes. The basic indicators in summing up results are the parameters of the new equipment and its efficiency compared with domestic and foreign analogues (and also with development prospects), patent aspects of articles, design and operating characteristics and so forth.

Many collectvies in scientific research establishments and planning and design organizations have gained solid experience of participation in all-union competition. In particular, the experience of the Belorussian SSR Academy of Sciences Institute of Mechanics of Metal Polymer Systems (IMMS) is worthy of note. Here, labor rivalry among scientific workers and subdivisions is developed under the motto "Each Scientific or Technical Development Should Be at Invention Level."

As the republic academy institute in the physicotechnical disciplines, the IMMS bears direct responsibility for drawing new conclusions of a fundamental nature. On the other hand, it is the head executor of a number of major tasks in all-union and republic goal-oriented scientific and technical programs. In addition, this collective is responsible for regional coordination of research, primarily in intersector problems connected with the development of new equipment for producing composites and technologic processes and equipment for producing articles made from composites.

The level of research and development and results are the main criteria in summing up the results of competition at the institute and for rewarding the winners. Thanks to the rational organization of socialist competition the IMMS collective has completed four major tasks in all-union scientific programs and seven in republic programs. All plan tasks completed have been directed

toward reducing the consumption of materials and lowering the prime cost of output, prolonging service life and saving resources. In the period 1976-1982 alone the collective made about 500 inventions and introduced in the national economy 173 developments producing a saving of more than R30 million. Virtually all the themes covered in the development of research on problems in the natural sciences have served as the basis for the development of inventions. Today the institute has almost 1,000 inventions to its credit.

Instructive experience has been gained at the All-Union Order of Lenin Gidroproyekt Planning and Investigation and Scientific Research Institute imeni S.Ya. Zhuk, the head organization for the planning of hydroelectric and hydroelectric storage power stations. It is a collective many thousand strong and with numerous departments and branches, design bureaus and investigation teams. Using its plans, during the 10th Five-Year Plan capacities rated at about 16 million kilowatts were commissioned at GES's and hydroelectric storage power stations. The institute's experience has been approved by the CPSU Central Committee. The value of this experience lies primarily in the fact that it is precisely all the future technical-economic characteristics of articles, machines, units and installations that are built into the plan (unfortunately, there are still some projects in the country that provide for the production of obsolete output or technical obsolescent articles).

The institute collective took the initiative in appealing to planning, scientific research and design organizations with the suggestion that competition should include the development of highly economic projects meeting today's requirements in scientific and technical progress. In their pledges the designers made provision for reducing estimate costs by at least R230 million, including R110 million above the confirmed plan, for the construction of hydroelectric units built to their plans during the 11th Five-Year Plan. Provision was also made for reductions of 370,000 tons in the consumption of cement and of 110,000 tons for rolled metal during dam construction, and these figures included 200,000 tons and 60,000 tons above the target respectively.

As long ago as 1974, in the practical work of Gidroproyekt extensive use was being made of agreements on competition and creative cooperation between collectives engaged in the construction of hydroelectric power projects. Coordination of their activity is effected by an all-union coordinating council and the construction coordination councils, and also by the same kinds of councils set up in organizations and enterprises engaged in the fabrication of unique technologic equipment, instruments, machines and mechanisms. The councils are made up of specialists, highly skilled workers and scientists. Competition between brigades carrying out specific sets of work at the construction sites is organized under their leadership, and likewise the summing up of results and presentation of awards to the winners. Best results are obtained in competition between brigades connected in the technologic chain linking project planning, the fabrication of equipment, and its assembly and commissioning.

Competition in accordance with agreements is supplemented by labor rivalry between the institute subdivisions. Results are summed up twice a year and winners are determined from the main indicator--the quality of projects. This

includes savings of material resources (metal, cement), labor costs for the consumer, and reductions in the estimate cost of construction (here, consideration is given only to the actual savings on resources in the working planning-and-estimates documentation passed to the client and used at the construction site, compared with those confirmed for the technical plan, and also in the technical plan compared with the confirmed technical-economic substantiation or substantiated project materials). When competition results are summed up an important role is played by indicators such as the number of projects rated excellent, the absence of notifications of defects and return of project plans for further work, the amount of planning-and-estimates documentation produced with the aid of computers, improvements in terms of invention, the granting of foreign certificates of inventions and patents, and the sale of licenses. In order to make a more objective assessment of the contribution of competition participants to overall results, labor norming and individual planning have been introduced, which make it possible to consider actual expenditures, labor productivity and so forth.

The Gidroproyekt initiative has been supported by more than 30 collectives within the system of the USSR Ministry of Power and Electrifcation, and the total size of the above-plan savings made in construction under the terms of their pledges is about R200 million. They also intend to save 375,000 tons of cement, 265,000 tons of rolled metal and 3 million man-days of labor costs in the national economy.

One typical feature in the development of science and production at the present time is, as is known, their interpenetration as the production process becomes increasingly a sphere for the application of science, while science becomes a factor and a function of the production process.

This also applies to the forms and methods of production and science management. What is new or advanced or justified in one given sphere can and must be broadly applied. It is a matter first and foremost of the brigade form of labor organization and incentive, which during the 11th Five-Year Plan is becoming one of the main forms in industry, agriculture and construction.

Experience shows that deep study of all the positive factors and of the characteristics of the shortcomings in development of the brigade form in material production and its use in a number of branches of science, taking into account their specific nature, can provide a considerable national economic effect. For example, designers at the Ulyanovsk State Special Design Bureau for Heavy and Milling Machines switched to the brigade form of labor organization and incentive in 1980. Just as in production, the number of brigades is established by the brigade council. The council also selects the brigade leader. The cost of work completed in project development is determined according to the sector normativs.

With the switch to the brigade form of labor organization, socialist competition has become more specific and effective and its results have been improved. The participants have an interest in doing work with fewer people: the part of the wages fund saved is distributed among the other members of the brigade. In the last 3 years the designers' labor productivity has risen 30 percent.

The direct participation of engineering and technical and scientific personnel in improving collective forms for the organization of labor and socialist competition in material production is of great socioeconomic and educational significance. Thus, at the Orekhovo Cotton Combine (Moscow Oblast) a comprehensive plan for engineering support for the brigade form of labor organization and incentive is being successfully implemented. In particular about 300 major steps have been taken to mechanize operations, and more than 3,000 units of new equipment and 5,000 units of modernized equipment have been set up. Engineering and technical work has been organized in direct contact with the brigades, and they conclude creative cooperation agreements among themselves in which their mutual obligations, time periods for the completion of joint measures, and also the questions requiring priority solutions with the aid of engineering and technical work are specified.

Depending on the nature of the task facing the brigades, they are assigned not only engineers but also their creative brigades, which as a rule solve many complex questions of improving equipment and organizing labor and production rapidly and at a high technical level. The result of this kind of engineering support for the brigade form of labor organization and incentive is obvious. Since the start of the five-year plan the collective has sold above-plan output worth tens of millions of rubles and it has increased by 20 percent output awarded the state mark of quality, and by reducing the numbers of personnel has saved more than R200,000 in the wages fund.

Careful study and extensive introduction of the experience gained during the course of all-union competition by leading scientific and production collectives is of great assistance in the successful fulfillment of party and government decisions on improving the economic mechanism and accelerating scientific and technical progress in the national economy. This in turn can and must raise the production forces of our society to a new level and lead it to the most advanced frontiers.

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RSFSR DECREES ON NEW AGRICULTURAL SCIENTIFIC PRODUCTION ASSOCIATIONS

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA RSFSR in Russian No 5, 1984, pp 74-75

[Decrees Nos 76 and 77 of the RSFSR Council of Ministers, issued 1 March 1984]

[Text] 45. On the Establishment of the Sredneural'skoye Scientific Production Association of the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR

The RSFSR Council of Ministers resolves:

1. To accept the proposal of the Sverdlovsk Oblast Soviet Executive Committee and the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR, which was submitted for approval to the USSR Ministry of Agriculture, on the establishment of the Sredneural'skoye Scientific Production Association of the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR consisting of the Ural Scientific Research Institute of Agriculture (the main structural unit) and an experimental design bureau.

To subordinate to the Sredneural'skoye Scientific Production Association the Krasnoufimsk Breeding Station, the Sverdlovsk Pilot Station of Horticulture, the Istok, Pyshminskoye and Trifanovskoye pilot production farms of the indicated stations and institute, which enjoy accordingly the rights which are envisaged by the General Statute on Scientific Research, Design, Planning and Design and Technological Organizations and the Statute on the Socialist State Production Enterprise.

The establishment of the indicated scientific production association is to be carried out within the limit of the number of workers of the management staff and the maximum allocations for the pay of this staff, which have been established for the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR.

2. The Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR is to approve the Charter of the Sredneural'skoye Scientific Production Association.

Chairman of the RSFSR Council of Ministers V. Vorotnikov

Administrator of Affairs of the RSFSR Council of Ministers I. Zarubin

Moscow, 1 March 1984. No 76.

46. On the Establishment of the Luch Scientific Production Association of the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR

The RSFSR Council of Ministers resolves:

1. To accept the proposal of the Kirov Oblast Soviet Executive Committee and the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR, which was submitted for approval to the USSR Ministry of Agriculture, on the establishment of the Luch Scientific Production Association of the Department of the All-Union Academy of Agricultural Sciences for the Nonchernozem Zone of the RSFSR consisting of the Scientific Research Institute of Agriculture of the Northeast imeni N. V. Rudnitskiy (the main structural unit) and an experimental design bureau.

To subordinate to the Luch Scientific Production Association the Falenki Breeding Station, the Kirov Pilot Station of Animal Husbandry, the Prigorodnoye and Saval'skoye pilot production farms and the Pilot Production Farm imeni XXIV parts'yezda of the indicated stations and institute, which enjoy accordingly the rights which are envisaged by the General Statute on Scientific Research, Design, Planning and Design and Technological Organizations and the Statute on the Socialist State Production Enterprise.

The establishment of the indicated scientific production association is to be carried out within the limit of the number of workers of the management staff and the maximum allocations for the pay of this staff, which have been established for the Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR.

2. The Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin for the Nonchernozem Zone of the RSFSR is to approve the Charter of the Luch Scientific Production Association.

Chairman of the RSFSR Council of Ministers V. Vorotnikov

Administrator of Affairs of the RSFSR Council of Ministers I. Zarubin

Moscow, 1 March 1984. No 77.

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CSO: 1814/197

USSR DECREES ON PERSONNEL CHANGES

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA SSSR in Russian No 6, Jun 84 p 94

[Decree No 1150 of the USSR Council of Ministers, issued 9 December 1983, and Decree No 1154 of the USSR Council of Ministers, issued 8 December 1983]

[Text] 36. On the Appointment of Comrade A. F. Kamenev as Deputy Chairman of the USSR State Committee for Science and Technology

The USSR Council of Ministers resolves:

To appoint Comrade A. F. Kamenev as Deputy Chairman of the USSR State Committee for Science and Technology.

Chairman of the USSR Council of Ministers N. Tikhonov

Administrator of Affairs of the USSR Council of Ministers M. Smirtyukov

Moscow, the Kremlin. 9 December 1983. No 1150.

37. On the Relieving of Comrade V. M. Velichko of the Duties of First Deputy Minister of Power Machine Building

The USSR Council of Ministers resolves:

To relieve Comrade V. M. Velichko of the duties of First Deputy Minister of Power Machine Building in connection with his transfer to a different job.

Chairman of the USSR Council of Ministers N. Tikhonov

Administrator of Affairs of the USSR Council of Ministers M. Smirtyukov

Moscow, the Kremlin. 8 December 1983. No 1154.

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G. V. TROITSKIY, CORRESPONDING MEMBER OF UKRAINIAN ACADEMY OF SCIENCES, CELEBRATES HIS 70TH BIRTHDAY

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 1, 1984 pp 142

[Text] November 1983 marked the 70th birthday and 46 years of scientific, pedagogic and public endeavors of German Vasil'yevich Troitskiy, Chief of the Department of Biochemistry at the Crimean Medical Institute, Honored Scientist of UkSSR and corresponding member of the Ukrainian Academy of Sciences.

This scientist started his scientific endeavors while still a student in the Department of Biochemistry, Rostov-on-Don Medical Institute, from which he graduated in 1937. His first investigations, which were generalized in a candidatorial dissertation defended in 1940, were concerned with metabolism of vitamin A. German Vasil'yevich Troitskiy was a participant in the Great Patriotic War he was in the field forces from 1941 to 1947.

Starting in 1947, G. V. Troitskiy worked in the Biochemical Laboratory of the Central Scientific Research Institute of Dermatology and Venereal Diseases in Moscow, where, along with investigation of metabolism of vitamin A and its links with blood proteins, he was concerned with methodological developments and proposed a new optical system for protein electrophoresis apparatus.

Starting in 1951, after defending his doctoral dissertation, and to the present time, he is chief of the Department of Biochemistry at the Crimean Medical Institute.

Discovery of conformational changes in blood proteins in the presence of pathology was a fundamental contribution to science. In 1964, he was the first to demonstrate experimentally and validate mathematically that 50 globular proteins, like fibrillar ones, have a beta structure. Subsequently, this was confirmed by X-ray analysis for lysozyme and other proteins.

Several modified blood proteins were isolated by preparation in the laboratory, under the guidance of G. V. Troitskiy; their optical, chemical and immunological distinctions were studied. It was established that, in the presence of pathology, blood albumin and immunoglobulins are the most variable proteins, and the mechanism of these changes was investigated.

A new method, developed in the laboratory, of isoelectric focusing in artificial pH gradients is used in theoretical research for analysis of biopolymers and in broad practice; in particular, some interesting data were obtained from experiments performed in space. This method is used extensively both in Soviet and foreign laboratories.

G. V. Troitskiy has authored more than 260 scientific works, 4 monographs, 10 inventions, and he is an excellent pedagogue. A total of 10 doctors of sciences and 35 candidates of sciences were trained under the guidance of G. V. Troitskiy.

German Vasil'yevich devotes much attention to scientific-public work; he is chairman of the Crimean Department of the Biochemical Society, a member of problem commissions of the USSR Academy of Medical Sciences and USSR Academy of Sciences, a member of the editorial board of the journal, VOPROSY MEDITSINSKOY KHIMII [Problems of Medical Chemistry], member of the editorial board of UKRAINSKIY BIOKHIMICHESKIY ZHURNAL [Ukrainian Biochemical Journal]. Since 1971 he has been a participant in a general plan of interacademy collaboration among academies of sciences of socialist countries for the study of structure and function of immunoglobulins; he has organized a number of international symposiums and seminars.

The endeavors of this scientist are highly regarded by the party and government: he was awarded the Red Star Order, Badge of Honor, Combat Medal and many other medals.

In congratulating German Vasil'yevich Troitskiy on his birthday, the scientific community wishes him health and new creative achievements.

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UDC: 578:92 Zhdanov

VIKTOR MIKHAYLOVICH ZHDANOV CELEBRATES 70TH BIRTHDAY

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 84 p 120

[Article by editorial board]

[Text] Viktor Mikhaylovich Zhdanov, academician of the USSR Academy of Medical Sciences, celebrated his 70th birthday on 13 February 1984. For almost half a century, the endeavors of Viktor Mikhaylovich in the area of health care have gained universal recognition.

V. M. Zhdanov graduated with honors from Kharkov Medical Institute in 1936, and in 1941, while working as a physician, he graduated by correspondence from the Physical Faculty of Leningrad University. V. M. Zhdanov developed interest in science at an exceptionally young age. Already at the age of 19 years, he performed his first experimental work, at the suggestion of Prof A. M. Utevskiy, on "Effect of Autolysates on Serum and Red Blood Cell Sugar Content." In 1936-1946, while serving in the border troops in the Turkestan Military District, Viktor Mikhaylovich worked on solving the most pressing problems of infectious pathology. His work dealing with etiology and epidemiology of infectious hepatitis (Botkin's disease) is referable to the same period; he offered proof of the viral nature of this disease. In 1947, this study was defended as a doctoral dissertation. In the late 1940's, while working successively as laboratory, department head and director of Kharkov Institute of Epidemiology and Microbiology imeni I. I. Mechnikov, V. M. Zhdanov concentrated the efforts of his team on investigation of regional pathology referable to the most important infectious diseases of that time. Then too, he developed one of the first classifications of viruses, a problem to which Viktor Mikhaylovich returned often in subsequent years. In 1968, V. M. Zhdanov was elected member of the International Committee for Classification and Nomenclature of Viruses. In the 1950's, V. M. Zhdanov headed the Sanitary and Epidemiological Service of the USSR, first as chief of the Main Epidemic-Control Administration of the USSR Ministry of Health, then as deputy USSR minister of health and chief health inspector of the USSR. He devoted all his efforts, experience and energy to organization of control of infection and improvement of the work of the sanitary and epidemiological service. Among the scientific developments of the 1950's, we should mention development of technology and production of several antiviral vaccines under the supervision of Viktor Mikhaylovich. In 1956, V. M. Zhdanov became the chief editor of the newly organized journal, VOPROSY VIRUSOLOGII [Problems of Virology].

In 1961, V. M. Zhdanov became the head of the Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences. More than 100 specialists with the highest qualifications, including about 40 doctors of sciences, graduated under his supervision.

For the last two decades, studies have been made of several basic problems of general virology dealing with the structure and function of viruses under the supervision and with the immediate participation of V. M. Zhdanov. Basically new data were obtained on biosynthesis of viral components, formation of virus-specific polyribosomes; a new human oncornavirus (type D) was discovered and its link to certain neoplasms established; a hypothesis was formulated, according to which fusion of viral and cell membranes is the universal mechanism of viral penetration into cells.

V. M. Zhdanov is credited with two discoveries recorded in the State Register, as well as several author certificates. The team he heads is involved in implementation of the All-Union programs, "Influenza," "Hepatitis," "Interferon," and "Chemotherapy of Viral Infections."

Viktor Mikhaylovich has published the results of his scientific research in 25 books. He has also authored hundreds of articles and summarizing surveys.

From 1971 to 1983, V. M. Zhdanov headed the All-Union Scientific Society of Microbiologists, Epidemiologists and Parasitologists imeni I. I. Mechnikov; he was president of the International Association of Microbiological Societies from 1970 to 1974. Viktor Mikhaylovich is an honorary member of scientific societies of the United States, Czechoslovakia, Poland and several other countries. In 1960, he was elected academician of the USSR Academy of Sciences and Academy of Sciences of the Hungarian People's Republic. USSR orders and medals have been bestowed upon him. He has been awarded the USSR Council of Ministers Prize.

We congratulate Viktor Mikhaylovich on his birthday and wish him further creative achievements.

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PROFESSOR I. B. ZBARSKIY, CORRRESPONDING MEMBER OF THE USSR ACADEMY OF MEDICAL SCIENCES, CELEBRATES HIS 70TH BIRTHDAY

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 1, 1984 pp 141-142

[Text] Prof Il'ya Borisovich Zbarskiy, chief of Biology Laboratory of the Institute of Developmental Biology imeni N. K. Kol'tsov, USSR Academy of Sciences and corresponding member of the USSR Academy of Medical Sciences, celebrated his 70th birthday on 26 October 1983.

In 1935, I. B. Zbarskiy graduated from Moscow University imeni M. V. Lomonosov and then completed his graduate studies in the Department of Biochemistry at the First Moscow Medical Institute imeni I. M. Sechenov, where he subsequently worked as assistant and docent. In 1945, he organized the Biochemical Laboratory of the Oncological Institute imeni P. A. Gertsen, which he headed up to 1959. Starting in 1956, I. B. Zbarskiy worked as head of the biochemistry group (and (from 1961 the biochemistry laboratory) at the Institute of Animal Morphology (presently the Institute of Developmental Biology imeni N. K. Kol'tsov), USSR Academy of Sciences.

His early studies were referable to the amino acid composition of proteins of various tumors, benign neoplasms and normal organs of human embryos and adults on the basis of vast material. These studies revealed some important patterns indicative of the presence of the same proteins in tumors that differed in histogenesis and localization, and the substantial differences between them and proteins of original tissues, of both adult humans and embryos.

The research of I. B. Zbarskiy and his colleagues deals with problems of composition, metabolic activity and functions of the cell nucleus and its component ultrastructures. He is in first place as researcher in this field in our country and among the first in worldwide science. For the first time, there was development of methods for isolating separating cell nuclei; the existence of a nonhistone, skeletal protein structure was demonstrated, which was subsequently named the nuclear shell or nuclear matrix; he discovered contractile properties in cell nucleus proteins, which consist of a complex of histones and nonhistone proteins; he discovered a previously unknown fraction of residual protein originating from the nuclear membrane. During studies of nuclei isolated from tumor cells, it was established even then that their nuclear fractions differ both quantitatively and qualitatively, as well as in their metabolic activity. Analysis of the findings enabled I. B. Zbarskiy to advance a fruitful conception of the role of the nuclear system of the cell in

disturbances of biosynthesis of nucleic acids and proteins, and their implications to the pathogenesis of cancer.

In the studies of nucleoproteins and nucleic acids of the cell nucleus, I. B. Zbarskiy and his fellow workers developed a method of separating nuclear material into fractions, which made it possible to investigate the composition and metabolic activity of proteins and nucleic acids of specific ultrastructures of the cell nucleus.

A series of works of I. B. Zbarskiy and his colleagues also deals with transport of amino acids and their accumulation in cells under normal and pathological conditions, molecular mechanisms of action of certain antineoplastic antibiotics, and they established interaction of the latter with DNA and inhibitory effect on transcription and replication.

In developing research on isolation and characteristics of nuclear substructures, I. B. Zbarskiy and his students recovered isolated nucleoli of normal and tumor cells and demonstrated differences in biosynthesis of different protein fractions of nucleoli between normal and cancer cells. Biochemically isolated nuclear membranes of liver, spleen and certain tumor cells were obtained and described for the first time.

The subsequent work of I. B. Zbarskiy was concerned with investigation of the nuclear matrix of normal and tumor cells, which is still being pursued. Protein fractions with high molecular mass were demonstrated in the matrix of tumor cell nuclei, which are wanting in a matrix recovered from normal and regenerative liver.

Studies were also made of proteins bound the most strongly with DNA in both the nuclear matrix of the interphase cell and isolated chromosomes, and it was shown that they are identical. These studies are of substantial interest to determination of the nature of the bond of DNA with the nuclear matrix and its role in DNA replication.

Prof I. B. Zbarskiy, corresponding member of the USSR Academy of Medical Sciences, is well-known in the USSR and abroad for his many years of scientific, pedagogic and public activities, as well as works of paramount significance in molecular biology, general and medical biochemistry and cytochemistry. He has authored more than 400 publications. Many young scientists with the highest qualifications have been trained under the guidance and with the consultation of Prof I. B. Zbarskiy, including 1 academician of the USSR Academy of Medical Sciences, 1 corresponding member of the USSR Academy of Sciences, 10 doctors and 31 candidates of sciences. Prof I. B. Zbarskiy was awarded the Order of the Red Banner of Labor and Badge of Honor. He is doing much public and scientific organizational work; he is a member of several scientific and learned councils, editorial boards of Soviet and international journals, Central Council of Biochemical Societies and chairman of the Soviet side of the biology group under the Soviet-Finnish Commission for Scientific and Technological Collaboration.

The editorial board of VOPROSY MEDITSINSKOY KHIMII [Problems of Medical Chemistry] warmly congratulates Il'ya Borisovich Zbarskiy on his birth and wishes him further achievements in his fruitful scientific endeavors.

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A. M. UTEVSKIY, CORRESPONDING MEMBER OF UKRAINIAN ACADEMY OF SCIENCES, CELEBRATES HIS 80TH BIRTHDAY

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 56, No 4, Jul-Aug 84 pp 473-474

[Text] July 3 1984 marked the 80th birthday and 60 years of scientific, pedagogic and public services of Aron Mikhaylovich Utevskiy, well-known Soviet biochemist, corresponding member of the Ukrainian Academy of Sciences, professor, doctor of biological sciences, chief of laboratory of cryobiochemistry of neurohumoral systems at the Institute of Problems of Cryobiology and Cryomedicine, Ukrainian Academy of Sciences.

After graduating from the biology faculty of Kharkov University in 1924, he became one of the first graduate students at the Ukrainian Biochemical Institute, which was founded in 1925 by A. V. Palladin, where he first studied biochemistry of avitaminosis and then processes of intracellular carbohydrate metabolism; he was the first to describe the effect of oxidation of pyruvic acid on formation of dicarboxylic acids in muscle tissue.

Starting in 1931, A. M. Utevskiy was head of the biochemistry department at Kharkov Medical Institute (KHMI) and concurrently of the biochemical department of the Ukrainian Institute of Experimental Endocrinology (UIEE); 2 years later he participated in organizing the biochemistry department at the Ukrainian Institute of Experimental Medicine (UIEM). The role of processes of intracellular metabolism in production, reservation and secretion of hormones--biochemical dynamics of endocrine organs--became the basic line of his research. This was the topic of the doctoral dissertation of A. M. Utevskiy, "Biochemical Processes in Endocrine Glands" (1935).

A. M. Utevskiy began a systematic study of metabolism of epinephrine, routes of its conversion and possible role of products of this hormone's metabolism in the mid 1930's, and this was reflected in the monograph, "Biochemistry of Epinephrine" (1939). That same year, he was elected corresponding member of the Ukrainian Academy of Sciences.

During the years of the Great Patriotic War, A. M. Utevskiy worked as a professor and then acting director of the Kirghiz Medical Institute, with which the Second Kharkov Medical Institute merged. In Kirghiz SSR, he participated in organizing enterprises for vitamin production.

Starting in 1944, A. M. Utevskiy again headed the biochemistry department of KHMI and biochemical department of UIEE, continuing to study catecholamines. Together with V. O. Osinskaya, he developed new fluorimetric methods for demonstration of epinephrine, norepinephrine and products of their oxidation; he identified the nature of a fluorescent metabolite (leukoxoadrenochrome), proved that there are "quinoid" pathways of catecholamine oxidation in tissues and demonstrated its physiological implications. The conception of "functional metabolism of adrenergic transmitter hormones," which he advanced and experimentally validated, is of basic significance.

In 1975, A. M. Utevskiy transferred to the Ukrainian Academy of Sciences, where he headed the laboratory of cryobiochemistry of neurohumoral systems that he had organized, in which he developed, together with his coworkers, a new direction of cryobiology--investigation of the effect of cryogenic factors on retention in biological systems of the capacity to "regulate and be regulated," as well as pursued a search for optimum methods of cryoprotection of hormonal transmitters and receptor mechanisms of regulation.

He has authored more than 200 scientific publications dealing with biochemistry. Also known is his work on the history of science of philosophy, natural sciences, books about Academician A. V. Palladin, popular science articles, books and articles dealing with the lecture form of propaganda.

The students of A. M. Utevskiy include 18 doctors and 65 candidates of sciences. He is chairman of the institute's Problem Commission and theoretical section of the Republic Council for Cryobiology and Cryomedicine, member of the Office of Philosophy (Methodology) Seminars of SVNTs [Northeastern Research Center] under the Ukrainian Academy of Sciences, chairman of the Kharkov council, member of the Presidium of the Ukrainian and Central Council of the All-Union Biochemical Society, Scientific Council of the Ukrainian Ministry of Health, honorary member of the board of the Ukrainian Society of Endocrinologists, member of the editorial council of the journals, VOPROSY MEDITSINSKOY KHIMII [Problems of Medical Chemistry] and NEYROKHIMIYA [Neurochemistry].

Aron Mikhaylovich has also performed well as a man of letters. His play, "Memorable Encounters" ran in many theaters of the USSR, as well as Bulgaria, in 1945-1950.

A. M. Utevskiy is the recipient of the Ukrainian Academy of Sciences A. V. Palladin Prize. He is an excellent lecturer and was among the first in our country to receive the medal imeni Academician S. I. Vavilov, which is the highest award of the All-Union Znaniye [Knowledge] Society.

A. M. Utevskiy has received medals, Honorable Diplomas of the presidiums of the Supreme Council of Kirghiz and Ukrainian SSR.

In congratulating Aron Mikhaylovich Utevskiy on his birthday, we wish him health, happiness and many years more of equally fruitful and creative endeavor.

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UDC: 615:92 Trinus

F. P. TRINUS CELEBRATES HIS 60TH BIRTHDAY

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 pp 121-122

[Article by All-Union Scientific Society of Pharmacologists, Ukrainian Scientific Society of Pharmacologists, Kiev Scientific Research Institute of Pharmacology and Toxicology, Ukrainian Ministry of Health, students, coworkers and friends]

[Text] Fedor Petrovich Trinus was born on 25 February 1924 in the village of Staryy Lyubar,Zhitomir Oblast, to a peasant family. Starting in August 1941, he was an active participant of the partisan movement in the Ukraine and Moldavia; in 1944-1945 he served in the ranks of the Soviet Army, was severely wounded and has combat awards. He has been a member of CPSU since 1957. In 1952, F. P. Trinus graduated from Kiev Medical Institute and in 1955 completed his graduate studies under the guidance of A. I. Cherkes, academician of the USSR Academy of Medical Sciences, in the department of pharmacology of the same institute; he worked until 1965 as assistant and docent in this department. From September 1965, F. P. Trinus headed a laboratory at the Kiev Scientific Research Institute of Pharmacology and Toxicology, Ukrainian Ministry of Health, and became the director of this institute in November 1968. In 1966-1968, he held the position of deputy chairman of the Scientific Council of the Ukrainian Ministry of Health. In 1956 he defended his candidatorial dissertation for the scientific degree of candidate and in 1966, his doctoral dissertation. He was confirmed with the title of professor in 1969. In 1976, F. P. Trinus received the UkSSR State Prize. The title of Honored Scientist of UkSSR was bestowed upon him in 1981.

The scientific endeavors of F. P. Trinus are notable for broad scope of pressing problems of pharmacology and toxicology, profound research mind and perceptible practical results. He published more than 160 scientific works, including 2 monographs, and has received over 60 author certificates for inventions; he trained 7 doctors and 11 candidates of medical sciences.

The basic research of F. P. Trinus dealt with problems of general pharmacology (pharmacokinetics and combined action of drugs), pharmacology of cardiovascular, nonsteroid anti-inflammation and antineoplastic agents. In recent years, this scientist formed and validated a new, independent scientific direction, antidotology. He developed an original classification of antidotes and

mathematical models of kinetics and dynamics of antidotes for quantitative evaluation of combined antidote therapy. Agents with antidote action, oxathiol, all alloxim and others were introduced to public health practice. The work of F. P. Trinus on pharmacology is notable for exquisiteness of methodological approaches and broad use of biophysical and biochemical methods. He chose an original method for studying an isolated strip of the aorta, which is presently used in Soviet and worldwide labratory practice.

Prof F. P. Trinus validated the conception of discretes routes of drug regulation of cardiovascular function and, on this basis, proposed a classification of vasoactive agents; he expounded the transmitter-membrane theory of mechanism of action of anti-inflammation agents; using the method of linear combination of atomic orbitals, he established that there is a relationship between structure, πelectron density in the phenyl radical of acyldiethylene triamides of phosphoric acid and their antineoplastic activity. Six original anti-inflammation, antineoplastic and other drugs (mephenamic acid, sodium salt of mephenamic acid, diiodobenzotef and others) were proposed, under the supervision of this scientist, to medical practice. F. P. Trinus repeatedly described the results of his investigations before All-Union and international forums. He honorably represented Soviet pharmacological science in the United States, Canada, Switzerland and other countries.

Prof F. P. Trinus is very busy with public services: he is deputy chairman of the All-Union Scientific Society of Pharmacologists and chairman of the board of the Ukrainian Scientific Society of Pharmacologists; he is chief toxicologist of the Ukrainian Ministry of Health, chairman of the section for drugs of the interagency commission of the Ukrainian Academy of Sciences and Ukrainian Ministry of Health; he is a member of the committee for Ukrainian state prizes, deputy chairman of the All-Union and chairman of the Republic problem commissions of pharmacology and toxicology; he is editor in chief of the interagency republic collection, "Farmakologiya i toksikologiya," member of the editorial council of the journal, FARMAKOLOGIYA I TOKSIKOLOGIYA, chairman of the specialized scientific council for pharmacology under the Kiev Scientific Research Institute of Pharmacology and Toxicology.

The Soviet government has rated highly the achievements of F. P. Trinus. He has been awarded the Order of the October Revolution, Badge of Honor and and six medals.

Such features of this scientist as breadth of interests, large scale of scientific creativity, the talent of a scientist and organizer, exceptional conscientiousness and principle-mindedness have brought him universal respect. The "Farmakoterapevticheskiy spravochnik" [Pharmacotherapeutic Guide], which he wrote and has gone through several editions, is the reference book of Soviet physicians.

The many students, colleagues and coworkers sincerely congratulate Fedor Petrovich on his birthday, wishing him good health and new creative achievements for the good of Soviet medical science and public health.

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UDC: 615.33+577.18]: 92 Yakobson

PROFESSOR L. M. YAKOBSON CELEBRATES 60 YEARS OF RESEARCH AND PRACTICAL WORK

Moscow ANTIBIOTIKI in Russian Vol 29, No 6 Jun 84 p 474

[Article by editorial board]

[Text] Lidiya Mikhaylovna Yakobson, professor, doctor of biological sciences, recipient of the State Prize and Honored Scientist of Kara-Kalpak ASSR, was born to the family of a white collar worker in Rostov-on-Don. In 1920, she graduated from secondary school and in 1924, from the Don University in the biological department of the physicomathematical faculty.

L. M. Yakobson started with practical work in the city of Mozdok, Terskiy District, in the capacity of laboratory head at the malaria station. This job, as well as work for several subsequent years at the North-Caucasus Bacteriological Institute (1931-1934), where she first had the job of assistant and then laboratory technician in different laboratories (bacteriological, serological, BCG), provided her with excellent special training in bacteriology.

The scientific endeavors of Lidiya Mikhaylovna Yakobson in Moscow started in the laboratory of biosynthesis of citric acid at the Central Institute of Fermentation (1931-1934).

However, her main investigations are linked with the All-Union Institute of Experimental Medicine, to which she moved in 1934, which was subsequently transformed into the All-Union Scientific Research Institute of Antibiotics, and the State Scientific Research Institute of Standardization and Control of Drugs, USSR Ministry of Health, where she headed the antibiotics department for over 20 years.

Being a major specialist in the area of studying antibiotics, Lidiya Mikhaylovna also conducted some very interesting and important research on pathogens of particularly dangerous infections. She participated in and headed several expeditions to control particularly dangerous infections in different territories of our country. Her studies of cholera bacteriophage are of special interest. Clinical use of cholera bacteriophage was preceded by innovative studies to recover new types of bacteriophage and polyvalent complete phage,

which were handed over to bacteriological institutes for production. The proposed phage-diagnostic method made it possible to identify, within 2-5 h, an isolated culture of cholera vibrions. An original experimental model of cholera infection in monkeys was developed for evaluation of the prophylactic and therapeutic effect of cholera bacteriophage.

Use of the developed cholera bacteriophage for preventive purposes on the Afghanistan border in 1939 was highly effective. No cases of cholera were recorded on the territory of our country.

In 1943, together with Prof Z. V. Yermol'yeva, L. M. Yakobson received the First Class State Prize, which they transmitted to the Defense Fund, for participation in organizing and performing much preventive work on the fronts of the Great Patriotic War, for development of new methods of laboratory diagnostics and phage-prevention of cholera.

During the Great Patriotic War, by assignment of the Sanitary [medical] Administration of the Workers' and Peasants' Red Army, Lidiya Mikhaylovna trained physicians--specialists in particularly dangerous infections, both in Moscow and during visits to the front.

It would be difficult to exaggerate the contribution L. M. Yakobson made to the study of antiobiotics, development of methods of standardizing and controlling antibiotics, assurring the quality of domestic preparations of antibiotics. All of the basic methods of standardization and control of antibiotics were developed under the guidance and with the participation of Lidiya Mikhaylovna.

Lidiya Mikhaylovna Yakobson was awarded the Red Banner of Labor Order and Badge of Honor for her work in the field of antibiotics.

There is complete justification for considering L. M. Yakobson the founder of the school of specialists in the area of standardization and control of antibiotics. More than 20 dissertations were prepared and defended under her guidance; they dealt mainly with development of methods for standardizing antibiotics and in-depth investigation of products in this group; over 100 reports were published in special journals. In addition, Lidiya Mikhaylovna edited several books dealing with methodological aspects of investigating various antibiotics.

Lidiya Mikhaylovna Yakobson continues to work actively on problems of standardization of antibiotics, being the vice chairman of the Pharmacopoiea Committee of the USSR Ministry of Health and member of the editorial board for the journal, ANTIBIOTIKI.

The editorial board sincerely wishes Lidiya Mikhaylovna Yakobson good health and long years of fruitful work.

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